

Tools
and
Foolishness

by

Harry C. McKown

FOOLS AND FOOLISHNESS

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Illustrated by

MARGARET WHITTEMORE

This is a book of information and inspiration — one that will dispel illusions, shatter worn-out traditions, destroy prejudices, and awaken in the reader a dynamic urge to abandon the crowd, to accept the philosophy and adopt the ways of great men and women of history whose contributions to modern progress once labeled them "fools" and their efforts "foolishness."

chool Activities Publishing Company

Topeka, Kansas

To Henry Ford
with the author's
Compliments,
H

Harry C. McKown



Fools and Foolishness

**BY
HARRY C. McKOWN**

**ILLUSTRATED BY
MARGARET WHITTEMORE**

FIRST EDITION

**SCHOOL ACTIVITIES PUBLISHING COMPANY
TOPEKA, KANSAS
1943**

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PRINTED IN THE UNITED STATES OF AMERICA

PREFACE

This book was born, as is explained in the first chapter, when a university professor exploded. It gradually developed from a small section of an address into an entire address, then into several addresses, and finally, due to numerous demands, into its present book form. It represents an examination of thousands of books, pamphlets, newspapers, magazines, minutes of meetings and conventions, records of courts and legislative bodies, and other sources. Only the better authenticated illustrations of intolerance have been included. It is offered with the hope that it will be found not only interesting but also educative.

The author is very grateful to the many individuals who have contributed directly and indirectly to this project and to the various writers and publishers who have granted permission to quote from copyrighted materials.

HARRY C. MCKOWN

GILSON, KNOX COUNTY, ILLINOIS

July 1, 1943

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I

THE FOOL AND PROGRESS

Some fifteen years ago two University of Pittsburgh professors were discussing things in general when one of them—the present writer—referred casually to a story current in the newspapers, a story about a scientist who had been experimenting with space-exploring rockets, with the intention of shooting himself into the stratosphere in order to learn something about the composition, spore life, sunlight, temperature, pressure, cosmic rays, and other elements and characteristics of this unknown part of our universe. The topic was hardly mentioned before the other professor exploded with a contemptuous snort—“Why, the d—— fool! Who ever heard of a man shooting himself into the stratosphere in a skyrocket!” Obviously, the discussion of this topic was settled right then and there, and so nothing more was said about it.

However, the writer went home disturbed in mind; it did not seem logical to him that a supposedly educated man should take such a hostile attitude toward a new idea. He recalled the well-known stories about Galileo, Bruno, Columbus, Fulton, Westinghouse, Edison, the Wrights, and other “d—— fools” whose ideas have not only been proved right, but who were later themselves credited with having made substantial contributions to our present civilization. So he began to delve into the history of new ideas, processes, procedures, inventions, and innovations, and this study became so interesting that he has continued it up to the present—and this book, representing more than

three hundred "foolishnesses," is one of the results of his intriguing investigation.

The term "fool" as used throughout this book is the popular designation of the individual who has a new idea, and "foolishness" is that idea. Naturally, there are many synonyms for "fool." Literature dealing with progress in the various phases of man's development is full of them. The "fool"—"crackpot", "nut", "crank", "quack", "lunatic", or "simpleton" — is "crazy", "stupid", "insane", "teched in the head", "wacky", "queer", "mad", "deranged", "irrational", "peculiar", or "eccentric."

And just as numerous are the scornful evaluations of new ideas. "Foolishness"—"pipe dream", "contraption", "guff", "folly", "lunacy", "absurdity", "bosh", "madness", or nonsense—is "fantastic", "incredulous", "new fangled", "silly", "absurd", "stupid", "visionary", "outlandish", "fanciful", "anomalous", "impractical", "chimerical", "farfetched", "illogical", "irrational", "unsound", or "idiotic." "Folly" has always been a euphonious and a favorite evaluation of some new idea. A few examples will illustrate: "Drake's Folly" (oil in Pennsylvania), "Fulton's Folly" (steamboat), "Flagler's Folly" (Key West Railroad), "Seward's Folly" (purchase of Alaska), "Vassar's Folly" (college for women), and "Langley's Folly" (airplane).

Perhaps if man had spent as much time in attempting to understand and appreciate a new idea as he apparently did in thinking up disdainful evaluations of it, his progress toward Utopia might have been greater. In any case, judging by the story of the development of civilization, tolerance appears to be an exceedingly rare human characteristic.

A moment's deliberation should cause anyone to recognize that (1) progress comes only through change—where there is no change, there is no progress; (2) new ideas almost always are designated “foolishness”; and, consequently, (3) “fools” have been responsible for every bit of progress this world has ever seen. However, apparently, judging by the attitudes taken toward suggested innovations, man has rarely had the time, the inclination, or the ability to appreciate these simple truths.

Obviously, not all change represents progress; some of it represents the opposite. Similarly, not all new ideas are sound; some of them are spurious. And of the thousands and thousands of devices that are constantly being invented, only a small proportion ever ultimately becomes successful. However, the first part of the statement in the previous paragraph always holds—there is no progress without change.

It is interesting to note, in view of the “pure-stock”, “superior-race” propaganda currently spread in certain parts of the world, that the history of foolishness shows that no particular race, creed, color, nationality, sex, age, or condition of material wealth, health, marital status, success, or position has had any mortgage on the fool-producing privilege. There have been white, red, black, yellow, and brown fools; religious and irreligious fools; male and female fools; young and old fools; rich and poor fools; sick and well fools; deaf, dumb, blind, halt, lame, crippled, and maimed, as well as physically unhandicapped, fools; loved and unloved fools; married and single fools; well-known and little-known fools; and fools of high position and low. Genius has been no respecter of original status.

Often it may be comparatively easy for those of us who have seen successful applications of a device or process to criticize the scoffing attitudes of our earlier fellowmen who saw the same device or process when it was crude, undeveloped, and unapplied. Further, probably, in spite of the ever present lesson which we should have learned, it often may be as easy for us to ridicule a crude, undeveloped, and unapplied device or process which we see for the first time today—a something which may be established as an essential in the life of tomorrow.

The educational purpose of this book is to decrease this possibility, to encourage the individual of today to take a tolerant attitude toward what may be the essentials of tomorrow. And, it is trite to state, we can check the effectiveness of this encouragement or teaching only by examining in one way or another the attitudes, ideals, and habits of evaluation present after instruction has been offered—assuming, of course, that these have changed, following this instruction. With this “examination” idea in mind, a chapter of “unfinished foolishness”—ideas, innovations, devices, and procedures which are still in the experimental stage but which, on the basis of their present degree of development, will probably be successful tomorrow—has been included.

Naturally, any presentation of this topic would be incomplete without an analysis of the reasons for, or the causes which result in, the persecution of the individual who proposes a new idea. It is obvious that a “fool” is a “fool” only because he has been so labelled or tagged; in reality, he may be, and very often is, an exceedingly intelligent individual—one far ahead of his time and crowd. But why is he called a

“fool”? Just what is the mental or emotional mechanism of the individual who reacts intolerantly? Why cannot he easily and readily recognize and appreciate the possibilities of the new idea? These are the questions which will be answered in the last chapter.

It is not the purpose of this book to suggest a direct and definite program aimed at the elimination of the trait of skepticism from the human race. Probably as long as humans are human, and progress implies change, such elimination would not only be impossible, but actually undesirable. Reasonable doubt is the first equipment of the scientist, and should also be a part of the mental equipment of every ordinary individual. An instantaneous “swallow-bait-hook-sinker-line-pole-fisherman-bank” type of open-mindedness would be as absurd as the “it-can’t-be-done” type of incredulity.

Our purpose here is to present accounts of striking examples of intolerance taken toward many of our present essentials and conveniences when they were first suggested, to “test” by describing some unfinished “foolishness”, and to analyze briefly the causes of intolerance, in the hope that the reader may find this material interesting, and will to some degree profit through its influence on his own general attitude of mind. Naturally, too, we hope that it will be encouraging to any “fool” who reads it.

Our theme is, then—

AN INTELLIGENT PERSON NEVER LAUGHS
AT A NEW IDEA.

II

IN AND ABOUT THE HOME

EFFEMINATE SOUP

Almost up to the time of the Civil War, Americans considered soup an effeminate dish and no "red-blooded" man would be caught eating it. General Winfield Scott, one of our greatest soldiers and Indian fighters, covered himself with ridicule and contributed materially to his defeat in the presidential campaign of 1858 by admitting, in an unguarded moment, that he was to have soup for dinner.—FRELING FOSTER in *Collier's*.

THE PIG!

While a prisoner of war at Hamburg, Dr. Antoine Auguste Parmentier, a French physician and chemist, learned about potatoes. In 1760, following the French crop failures, Parmentier, recalling his experience with potatoes, wrote a little booklet on the subject, suggesting how both the farmer and the city consumer might profit from such a crop. His idea was widely ridiculed, one editor writing, "Potatoes are fit only for pigs to eat; and Parmentier's a pig for believing that humans can eat them."

Undiscouraged, Parmentier, with the help of Louis XVI, planted some potatoes in a space which was guarded day and night by soldiers. When the potatoes were large enough to be eaten, the soldiers were withdrawn from around the "treasure garden"—as it was called. That night curious Parisians sneaked in, dug up the potatoes, ate them, and liked them—and the

potato soon became established as a staple French food. And—potato plants still flower each year on Parmentier's grave.—Adapted from DONALD CULROSS PEATTIE, "Cargoes and Harvests," pp. 158, 159, D. Appleton-Century Company, 1926.

WORTHLESS HADDOCK

Years ago haddock were considered worthless as food and, when caught on cod-fisherman's hooks, were thrown back into the sea. Then some "fool" had an inspiration. He cut some haddock into small boneless slices and sold them easily. Later, he had another inspiration and wrapped them in parchment paper. Soon he had a well-established business. Today, haddock is one of our most popular ocean fish.

PASS THE DANDELION PIE

"There's no need for America to go hungry," says Dr. George Washington Carver, Tuskegee Institute's renowned chemurgist, "as long as nature provides weeds and wild vegetables which can serve not only as medicine but as food. Dandelion, sorrel, wild grass, and other weeds often prove more nutritious than their domesticated cousins."

And to prove his point he has made and served "sour grass" (sorrel) pie, wild rhubarb and pigweed "greens," pepper grass salad, poke "salate" pickles, and other dishes. He has recipes using dandelions, wild lettuce, wild primrose, and a number of other plants.

CANCER-PRODUCING LOVE APPLES

Up until about a century ago the tomato was not eaten in America. It went under such names as "love apple" and "shades of night," and was popularly sup-

posed to "poison you" or "give you cancer" if you ate it. Children, especially, were forbidden to eat this brilliant red vegetable. In those days the tomato had not been developed and was much smaller than it is now. But it was a pretty vegetable and was widely used as a border plant for flower beds.

In 1822, Michele Felice Corne, a Neapolitan artist, settled in Newport, Rhode Island, and built a home. In his adjoining garden, among other vegetables, he planted some tomatoes and, when they were ripe, despite the death prophecies of his neighbors, served them—often three times a day—at his table. He even wrote poems about them. His skeptical neighbors, noting his continued good health, reluctantly began to follow his example.

Corne died in 1845, and the simple headstone in Old Cemetery, Newport, commemorates his achievement of introducing and popularizing the tomato as a safe article of diet. Years later the local historical society placed on his old home a marker bearing the following inscription:

Corne House; Home of the Artist, Michele Felice Corne
Who Introduced the Tomato into This Country.

FINGERS WERE MADE FIRST

Table knives and forks are of comparatively recent origin; they were unknown to the Greeks and Romans. When an attempt was made to introduce them into English society, a wave of opposition swept over the land. And a French monarch banned them during his reign.

The two main arguments against them were:
(1) using them is an "affront to the Almighty who

provided fingers and thumbs," and (2) "taste begins in the fingers."

A BARBARIAN BEVERAGE

Coffee, introduced into France in 1644, was popularly called a "barbarian beverage" and few people would drink it. European religious and educational bodies bitterly denounced it—also tea, which was already somewhat established. Some decades later, King Gustav III of Sweden, familiar with the many stories about the injurious effects of these drinks, decided on a unique experiment. He had brought before him



Irreverent, silly, and dangerous!

twin brothers who had been condemned to death for murder, and promised commutation of their sentences to life imprisonment, provided one would drink tea daily, and the other, coffee. They agreed. Years and years later one brother, the tea drinker, died at the age of 83. There is no record of the death of the other, but

he may have lived longer. Today, the world's hourly consumption of coffee is some 50,000,000 cups.—*Science News Letter*.

COFFEE EXCITES THE ANIMAL PASSIONS

"Coffee loosens the tongue, fires the eye, produces mirth and wit, excites the animal passions, and leads to remarks that we should not have made in other circumstances, and which it were better for us and the world never to have been made."—From "The Young Wife, or Duties of Women in the Marriage Relation," a book published in Boston in 1838.

THE TRAGIC RESULTS OF CHEMICAL COOKING

When baking powder was first introduced, about 1850, it was greeted with howls of derision. Too, the majority of people were really afraid to use it. It represented "cooking with chemicals," and this, to the uninitiated, meant that it was poisonous.

The frantic manufacturers tried to show the people that this new product did only what yeast did—it merely caused the dough to rise. The little gas bubbles which pushed up through the dough were harmless. But this explanation only caused more trouble; "If the chemicals cause the dough to rise, they will continue to act after the bread is eaten and will inflate and distend the stomach." More than one newspaper and magazine carried cartoons showing "the effects of eating chemical bread"—whole families, as well as domestic animals, bloated, floating up against the ceiling.

HE CHANGED HIS UNDERWEAR

Neither the theory nor the practice of the modern saying, "Cleanliness is next to godliness," was

known up to about a century and a half ago. Fancy exterior clothing was worn by the *élite*, but bathing was conspicuous by its absence, while underwear, worn only in winter, was rarely or never changed. "Lunatic Beau Brummel, a swaggering and conceited London dandy," bathed often and changed clothes frequently—and boasted about it. Enjoying the ridicule heaped upon him, he went to work seriously and designed, wore, gave away, and sold new styles of hats, shoes, underwear, collars, jackets, and hose—which were untraditional, to say the least. And—"He had more influence than a thousand tailors," said a friend at his death.

POISONOUS STOVES

When cast iron stoves were first manufactured, the promoters had great difficulty in selling them because the story had been circulated that iron when heated gives off a poisonous gas.

DEGRADING MAN'S HEADDRESS

The tam o' shanter was commonly worn as a headpiece by Scotch plowmen about the middle of the past century. Just before 1900 it, in a modified form, was introduced as a headdress for girls and young women. This innovation immediately brought a storm of ridicule—not only because the new hat was "unsightly", "silly", and "atrocious", but also because it "degraded an important item of man's dress."

INVADING MAN'S SACRED SANCTUARY

It has been only a very few years since women began to have their hair bobbed and to "invade man's sacred sanctuary"—the barber shop. At the beginning

of the doobed-hair era this expression was used in newspapers and magazines times without number.



Disgusting! Scandalous! Shameful!

RAYON—A TRANSIENT FAD

When rayon was first put on the market, a committee appointed by silk manufacturers to study its possibilities declared it a transient fad.—*Reader's Digest*, October, 1937.

TOO FEMININE

During the cold weather in the northern regions man had for years protected his ears by means of bandages, fur caps, and caps with various kinds of pull-down bands and flaps. About 1875 Chester Greenwood designed and placed on the market his "Champion Ear Protectors"—the ear muff. This

new-fangled "bastard hat" was laughed at from one end of the country to the other. It was considered "too feminine" for he-men to wear.

THE SORE THROAT FAD

During Queen Elizabeth's time the English gentleman wore a "starched and corrugated millstone" around his neck. Obviously this collar was both expensive and uncomfortable. Usually it could be worn but a single time. Finally, as a neckpiece, it began to shrink and shrink until it developed into a more or less simple swathing of the neck, and this "sore throat bandage," as it was called, was the style for a number of years in our own country.

INSULTING THE ALMIGHTY

A French monarch forbade the use of blue cloth in both men's and women's clothing because, "God's sky is blue, and man's imitation can only be insulting to the Almighty."

THE TRIUMPH OF TROUSERS

Before the French Revolution well-dressed men wore knee breeches, while the rabble wore long trousers. When the French monarchy was overthrown, long trousers became a symbol of the revolution. Since anyone whose outward appearance during that time brought him under suspicion of being an aristocrat went about in danger of his life, even wealthy men wore the blue pantaloons of the common people.

Curiously enough, the fashion was introduced to England by such dandies as Beau Brummel and the Prince Regent, men bitterly opposed to the democratic

principles which trousers had been chosen to represent. England's acceptance of trousers was not immediate, however. Cambridge University, in 1812, decreed that students appearing in hall or chapel in long trousers should be considered absent. The Duke of Wellington was barred from Almack's, London's favorite resort, because he was wearing trousers. In 1820 one sect of the Church of England ordered that no preacher who wore long trousers be allowed to occupy a pulpit, and even today knee breeches are still worn in court-dress.—ROBERT HOGG in *Reader's Digest*, March, 1940.

CASH-AND-CARRY-SHAVING

Although shaving is a very old custom of man—bronze and iron blades have been found in graves of prehistoric man—"the absurd custom of men's getting shaved in barber shops" is of comparatively recent origin. The barber shop really began with the introduction of the peruke or powdered wig, which was white and consequently would not match brown, black or red whiskers. Travelling barbers, who went to their customers' homes, were too expensive for the man of average means, and business-minded barbers began setting up their "shops" where wig-wearing heads could be clipped and non-matching whiskers could be removed at a reasonable figure.

A rather well-known eighteenth-century cartoon of a "shaving mill" illustrates the general reaction to this barber shop idea. This contraption, powered by a horse on a tread mill, consisted of a device with appropriate holes into which gentlemen had their heads thrust. Revolving razors did the rest. It represented a sort of nickel-in-the-slot, cash-and-carry, instantaneous-shaving procedure.

THE DANGEROUS UMBRELLA

The ancient Greeks and Romans used a non-collapsible type of umbrella for protection against the sun and the rain. However, when the collapsible umbrella was introduced by a German inventor during the latter part of the 18th century, the wiseacres opposed it with a blast of ridicule and abuse. In England it was deemed irreligious and irreverent for one to shield himself from the rain. And the first man who carried an umbrella in public was arrested for disturbing the peace—scaring horses, frightening the children, and taking up too much space on the sidewalk. The invention was called “silly”, “dangerous”, and of “very uncertain value” by newspapers.

ANOTHER FEMININE DEVICE

The safety razor, in its infancy had to overcome, not only established tradition, but also the general attitude on the part of the public that it was a feminine device, “one which ladies of quality might use under their arms,” but not one which a man would use.

The fact that a half-interest in one of our present day most popular safety razors went begging for \$500 shows the value placed on this all-but-essential piece of equipment.

SMOKING WASN'T POPULAR, THEN

Today, the world's hourly tobacco bill is \$1,500,000, but in the seventeenth century a smoker was punished by being executed after having his lips split (Japan, China); having molten lead poured down his throat (Persia); being whipped for first, and executed after second, offense (Russia); having his nose pierced and his pipe thrust through it (Turkey).

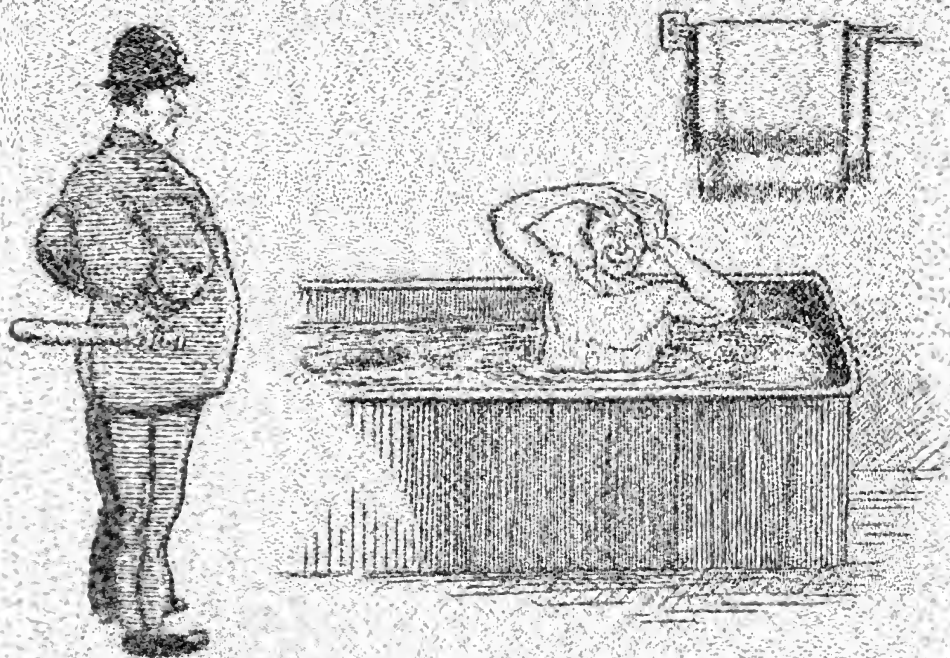
Governor Craddock of Massachusetts forbade the use of tobacco except upon a physician's prescription; another colonial governor and council forbade smoking in the fields, on the highway, or within a mile of any house; and Pope Urban VII issued a papal bull against it. Queen Victoria prohibited the use of tobacco in any form in Windsor Castle.

A MENACE TO HEALTH

Queen Isabella of Spain, the supporter of Columbus and his explorations, once boasted that she had "taken only two baths in my life" and was "proud of it."

In the 1,000-room palace of Catherine the Great of Russia there was only one bathtub—a small affair made of tin—and it was located in a "meager and mean room."

"The Queen (Elizabeth) hath built herself a bath wherein she doth bathe herself once a month, whether



Bath tubs is unlawful, y'er pinched!

she require it or no," ran a snappy item from a gossip sheet of Queen Elizabeth's time.

When the Saracens invaded Spain they brought with them bath tubs and the practice of bathing. But pious Spain would have nothing to do with "this abomination of the infidel." And King Ferdinand issued a royal edict commanding that all bath tubs be destroyed.

India at the time of the Great Mogul led the world in bath-consciousness, but bigotted Spain, Italy, Britain, France, and Germany went bathtubless.

It is believed that the first stationary bathtub was constructed—of mahogany and sheet lead—in Cincinnati in 1843, being exhibited on Christmas Eve of that year. It was immediately ridiculed as "a useless vanity", "an undemocratic luxury", and "a menace to health."

In 1845 the Boston City Council prohibited bathing except on the advice of a physician, and this law was in effect until 1862. A somewhat similar law in Philadelphia failed to pass by two votes. In 1846 the state of Virginia taxed bathtubs thirty dollars a year.

IMPOSSIBLE!

Some 40 years ago, James B. Duke, head of the American Tobacco Company, commissioned one of his assistants to "devise a machine that will turn out cigars as good as handmade." The general tobacco industry scoffed at this idea and called it impossible. But Patterson and his engineers persisted and in 1902 placed on the market a crude cigar-making machine. During the following years Patterson, now head of American Machine & Foundry Company, American Tobacco's subsidiary, spent more than seven million

dollars in perfecting the cigar maker. However, machine-made cigars had relatively little sale until after the World War. About 95 per cent of American cigarettes (some 180,000,000 a year), and practically all machine-made cigars, come out of American Machine & Foundry Company's machines.

THE BLACK ROCKS WON'T BURN

The burning of coal was denounced in the reign of Edward I as a "great nuisance, corrupting the air with its stink and smoke, to the great detriment of the health of the people," and the king forbade its use. In 1306 a citizen was tried, condemned and executed for burning "sea cole."—E. O. MASON and L. W. CHUBB, *Smoke*, "Encyclopoedia Britannica," 11th ed. (1911) vol. xxv, p. 275.

In 1580 Queen Elizabeth prohibited the use of coal in London while Parliament was in session because "the health of the knights of the shires might suffer during their abode in the metropolis."—O. E. NORMAN, "The Romance of the Gas Industry," p. 160, A. C. McClurg and Company, 1922.

Coal was discovered near Pottsville, Pennsylvania, quite by accident. Nicholas Allen, a hunter, left his fire burning one night and the next morning found "the mountain on fire." Rushing to Pottsville he told of his experience but was laughed at; the Pottsvillians thought he was drunk. He returned to the mountain, dug out a few pieces of the coal, brought it back to town and fired it, but his audience was unappreciative. Finally, he did sell some of it to blacksmiths, but none to householders. For two decades Allen attempted unsuccessfully to get someone to go into partnership with him in a coal mine. Ultimately

he persuaded Colonel George Shoemaker of Pottsville to join him.

By this time a little coal had been sold to Philadelphia blacksmiths, but practically none for home use. People called coal "black stones," and one man even swore out a warrant for the arrest of a coal peddler charging him with "selling rocks painted black." In 1803 the Lehigh Coal Company gave away, for use in making sidewalks, two boatloads of coal which it could not sell.

So Colonel Shoemaker knew he was facing trouble when, in 1812, he hauled nine wagon loads of coal to Philadelphia. By the time he had sold two loads a kindhearted stranger informed him that a warrant had been issued for his arrest as a "swindler who is selling rocks that won't burn." Hurriedly, Shoemaker gave away the remaining seven loads and returned to Pottsville—by way of back country roads.

GAMBLING WITH GOD

During his official lifetime as ruler of the French state, a well-known monarch prohibited the sale of life insurance because, "Only the Almighty knows when a man is going to die, and therefore investing in life insurance can only mean gambling with God."

DRAKE'S FOLLY

Edwin L. Drake, a resident of Titusville, Pennsylvania, long had heard about oil wells. He studied up on the subject, examined as best he could the geological formations around his home town, and decided that great quantities of oil existed in the subterranean cavities under it. So he set about making plans for drilling. In order to avoid the ridicule that

he was sure would come were it known that he was actually drilling for oil, he told his curious friends and neighbors that he was drilling an artesian well.

This story appeared to satisfy Drake's fellow townspeople temporarily. However, later the word got around that he was really drilling for oil. And this brought the ridicule that he had hoped to avoid: "Are these men crazy? Imagine actually drilling for the worthless stuff that has for years been contaminating the creeks and wells." For months Drake and his partner, George H. Bissell, continued drilling and found nothing. After about a year the slim treasury of the company was exhausted, and the workmen refused to continue. The project was called "Drake's Folly," and became the laughing stock of all western Pennsylvania.

In spite of many discouragements and low finances, drilling was continued and finally oil was struck, and the world's first oil well was a reality.

However, two new difficulties arose to plague the company. In the first place there was little market for the oil, and in the second place, no railroad was close on which to transport it. The company overcame the first trouble, in time, by giving away both oil and lamps full of oil, thus demonstrating that the new petroleum was as good for lighting purposes as whale oil, and that it was much cheaper.

Oil from the fields had to be hauled over rough country roads in wagons to the freight terminals, and the teamsters, believing that the industry was going to make its promoters wealthy raised their rates until they became practically prohibitive. Then one of Drake's fellow citizens came out with a crazy idea. Said he, "Water to Philadelphia is pumped up hill and

down, why can't we pump oil the same way?" This sounded reasonable to the company, and so a pipeline was begun, which ran some 87 miles from the oil fields to the Oil Creek Railroad. When the teamsters realized what was being done, they attacked the pipeline workers, drove them away, and tore up the pipeline.

But, in spite of ridicule, riots, and bloodshed, oil wells and pipelines multiplied until today oil represents a thirteen billion dollar industry. There are approximately 106,000 miles of petroleum, and 3,800 miles of gasoline lines in the United States. The world's hourly production of petroleum today is 170,000 barrels.

LIGHTING WITH SMOKE

When gas lights were first introduced into France they were considered merely "a new fangled fad" that would disappear shortly. However, when later gas lights began to compete rather seriously with candles, Napoleon himself said "the whole scheme is a grand folly."

Scientists stated that the idea of storing gas in reservoirs was not feasible, and the aesthetically minded citizens said that "studding the landscape with unsightly reservoirs is a symbol of degrading commercialism."

Even as late as 1833 a petition was addressed to the city council of Philadelphia protesting against the use of gas, an article "as ignitable as gunpowder and as nearly fatal in its effects as regards the immense destruction of property." The conservatives believed that "this powerful and destructive agent must necessarily often be left in the care of youths, domestics, and

careless people" and therefore they wondered that "the consequences of employing it had not been more appalling."—WALDEMAR KAEMPFERT, "A Popular History of American Invention," vol. I, p. 554, Charles Scribner's Sons, 1924.

Friederich A. Winzer was a Moravian promoter who moved to London, changed his name to Winsor, and attempted to interest the city in gas street lights. He set up an exhibit of gas lights and fixtures of various kinds and, after some trouble, obtained permission to erect gas street lamps in front of the building in which he housed his exhibit. The public thought there was some sort of "black magic" involved and was very suspicious. Winsor planned a few open-to-the-public demonstrations, but these turned into mass meetings against the invention when in answer to questions concerning the source of the gas they were told that it came from coal. Now they knew something was wrong because "any fool knows that coal produces only smoke." Even Sir Humphrey opposed the idea. And so did Byron and Sir Walter Scott, the latter writing, "There is a madman proposing to light the streets of London—with what do you suppose—smoke!" It was ten years after being first suggested that the gas light idea for the streets of London was accepted.

When the idea of gas street lights was first introduced into the meeting of the city council of Boston it was rejected on the basis of the following all-embracing arguments.

Religious—God meant it to be dark.

Moral—It will kill fear of darkness.

Police—Thieves will be emboldened.

Physical—Gas will poison the air.

Mystical—Young people will be encouraged to go out at night.

Aesthetic—It will rob festive occasions of their charm.

Despite these arguments, lights came to Boston in 1822, to Baltimore in 1817, to New York in 1823, and to Philadelphia in 1841.

HOW CROSS THE RIVERS?

Natural gas engineers were hastily summoned when the great oil fields of the Texas Panhandle were discovered. Their advice was sought on the problem—"The possibilities of local use of this gas are extremely limited. Some way must be found to use it. We'll have to pipe it to Kansas City and St. Louis—maybe even to Chicago."

At the last statement the engineers broke into laughter, and one of them jumped to his feet and exclaimed, "Why, it can't be done. No pipes are strong enough to stand the pressure for a thousand miles. And besides, how would you cross the Missouri and Mississippi rivers?"

NOW—Some 65,000 miles of natural gas lines carry 2,000 billion cubic feet of gas each year.

AN ELECTRIC DOODAD

A great New York newspaper 42 years ago ridiculed a man in East Orange, New Jersey, who had a crazy notion that he could supplant gas lights with an "electric doodad."

The managing editor of another New York newspaper rebuked the city editor of his paper for publish-

ing a feature article on Edison's electric light, on the grounds that such a light was against the laws of nature.—“Technological Trends and National Policy,” p. 53, National Resources Committee, Washington, D. C., June, 1937.

A few years later in Parliament a committee reported on a plan for using arc lights on the streets of London. A member asked the chairman if the committee had consulted the views of Mr. Thomas Edison of America, and the reply is there for all to read, “No, because Mr. Edison has no scientific standing.”—*Scribner's Commentator*, September, 1937.

Henry Morton, president of Stevens Institute of Technology, protested against the trumpeting of results of Edison's experiments in electric lighting as “a wonderful success, when everyone acquainted with the subject will recognize it as a conspicuous failure. . . . Edison has done and is doing too much really good work to have his record defaced and his name discredited in the interests of any stock company or individual financier.”—*The New York Times*, December 28, 1879.

“Conspicuous failure,” eh? In 1882 Edison carried all the incandescent lamps in the world at the time to New York in a market basket. Now the annual production totals 900,000,000 lamps.

The installation of electric lights in the homes of a thousand communities in America was delayed because of the rumor that spread like wildfire—“Electric currents running around the house are mysteriously unhealthy.”

AN INITIATION THAT BACKFIRED

One of the reasons why you can buy an electric light bulb today for 15 cents that in 1931 would have cost 40 cents and would have delivered only half the present quantity of light, is the joke old-timers in General Electric's lamp division used to play on new engineers. They were assigned the "impossible" task of frosting bulbs on the inside. Such a bulb would diffuse more light with less absorption, but everyone knew that it couldn't be done . . . and each perspiring neophyte forgave the snickers greeting his failure.

One day, however, Marvin Pipkin was initiated. And he not only found a way to frost bulbs on the inside, but developed an etching acid which gave minutely rounded pits instead of sharp depressions, thus materially strengthening each bulb. No one told him it couldn't be done, and he took it so seriously that he did it.—*Christian Science Monitor*.

THE WORK OF THE DEVIL

Reverend William Lee, while watching his wife sew, was inspired with an idea to invent a machine that would do this work. He designed a model and made the necessary application to Queen Elizabeth for a patent on it. But the queen refused even to consider his application. Later Lee did build a small shop around his device, but due to the opposition of the ruling class he died bankrupt and broken-hearted.

In 1830 Bartholomey Thimmonier in Paris invented a sewing device which by 1841 was fairly successful. He built a factory and began to produce machine-sewed garments. The tailors of Paris or-

ganized a mob which broke into his factory and destroyed both it and the machines. Undiscouraged by this misfortune, Thimmonier tried again, and again in 1848 he was burned out. A short time later he died in abject poverty.

Elias Howe, Jr., was called an idle dreamer and a lunatic by his own neighbors when he set about to design a machine that would sew. However, he persisted in spite of contemptuous taunts and ultimately built a sewing machine, sewed himself a suit of clothes on it, and wore this suit before his friends. He patented the device and then tried to interest several American tailors in it. They could see no future in it and too, they were "averse to its introduction." Howe's first machine, exhibited in Boston, was smashed to pieces by a mob as "the work of the devil." Virtually driven out of America, Howe went to England and sold two of his sewing machines. However, he found little encouragement. Financially he was reduced to the point where he would probably have starved but for the aid of his few friends. At last, thoroughly discouraged, he sent his family back to America on the charity of the captain of a Yankee packet-ship. Then he pawned his model and his patent paper, took the "Poor Debtor's Oath" in order to save himself from imprisonment, and came back to America himself. Here he found that people had ceased to scoff, but, too, he found that his patent had been infringed upon time and again. His sewing machine, finally, was a success, but the many infringement suits were heart-breaking and costly.

Henry of Navarre became King of France in 1589 and immediately began to encourage the development

of the nation's carpet industry. He was quite successful. However, most of these French rug weavers were Huguenots, and due to persecution during the reign of Louis XIV many of them fled to the English towns of Axminster and Wilton, where they set up their looms. And even today the names of Axminster and Wilton rugs are well known throughout the world.

IT HAS FIVE FLOORS AND NO WALLS

After seeing a room "carpeted" (tapestried) on the sides as well as on the floor, a wiseacre wag exclaimed, "This is no room; it has five floors and no walls."

SOME TRICKERY ABOUT THIS

On March 11, 1878, Edison's "phonograph" was demonstrated before the Academy of Science at Paris by Count du Moncel and M. Puskas, Edison's French licensee. Puskas arranged the machine and spoke into the mouthpiece, "The phonograph is highly honored at being presented to the Academy of Science." Amid breathless silence the machine repeated the sentence. Immediately one member of the Academy jumped to his feet and shouted, "There is some trickery about this; a machine can't produce an accent. This is merely a piece of ventriloquism." And, judging by the nodding heads, several other members agreed with him. Then du Moncel set the machine and said, "We thank Mr. Edison for having sent us his phonograph." And this sentence came back with du Moncel's unmistakable inflection and accent. The skeptics had to admit that "the thing worked"—as one of them stated afterwards.

IMPRACTICAL; SILLY; GODLESS

In an early day nearly every community went by its town clock, which was usually started, at least, on "sun time" or "God's time." With the coming of the railroads some standardization became necessary, so each railroad company arbitrarily began "zone time" by basing its schedule on the time of some large city in the general territory covered. However, this helped but little, because, as a result of the different bases used, most of the junctions had several different kinds of time.

In 1878 Sandford Fleming, of the Canadian Pacific, suggested a meridian plan—which was instantly called "impractical" by scientists, "silly" by newspaper editors, and "Godless" by preachers. A Royal astronomer even went so far as to call Fleming "a Communist who opposes the will of God."

BUT—Fleming fought it out, and won. And in 1936 a commemorative plaque was mounted at the front of the Sons of England Hall, where he had first publicly proposed "standard" time.

III

COMMUNICATION

HOG BRISTLES AND BLASPHEMY

When permission was granted, in 1727, for the establishment of a printing press in Constantinople, with the provision that the Koran should not be printed, the venture none the less aroused such intense opposition that it was abandoned, and printing was not introduced again for about a century. The Koran was never printed in any Islamic country until a few years ago. The reason given was the belief that to touch the name of Allah with a cleaning brush made of hog bristles was blasphemy.—“Technological Trends and National Policy,” p. 48, National Resources Committee, Washington D. C., June, 1937.

ROOT OR BE ROOTED

During the time when William Caxton was developing his printing processes, an important official of the most influential religious organization said, “We must root out printing, or printing will root us out.”

HAS DIVULGED DISOBEDIENCE AND HERESY

In 1670 Governor Berkeley of Virginia expressed a widespread sentiment against education and printing in these words: “I thank God there are no free schools nor printing, and I hope we shall not have them these hundred years; for learning has brought much disobedience and heresy and sects into the world, and

printing has divulged them and libels against the best government."—A. M. SIMONS, "Social Forces in American History," pp. 47, 48, The Macmillan Company, 1914.

ACCEPTED IT SLOWLY

The Chinese had been printing on paper for a thousand years before the Mohammedans finally decided to use the same process in their various types of communication and records. And it was another great span of time before the Christians finally accepted the printing press as an agent of the good.

WASTING TOLLS

One day in July, 1914, Karl von Wiegand, then Berlin correspondent of the United Press, learned of a circumstance he thought merited detailed reporting. He cabled 138 words on the subject to New York and was reproached by return cable for wasting tolls. The circumstance he had so recklessly chronicled was an ultimatum from Austria-Hungary to Serbia, which made the World War inevitable.

Since then . . . the wordage of foreign news that pours into the United States every day has become enormous. The New York headquarters of that same United Press estimates its foreign report at about 25,000 words a day. Other press services transmit about as much. The New York Times receives an average of almost 12,000 words daily from its own foreign correspondents. It had 22,000 words from its own reporters covering the coronation of King George VI. The abdication of Edward VIII occupied 42 columns of the newspaper.—MORRIS GILBERT, "From Usu-

CONGRATULATIONS, COPS!

An Eastern newspaper published in 1865 contains the following story:

A man about 46 years of age, giving the name of Joshua Coppersmith, has been arrested in New York for attempting to extract funds from ignorant and superstitious people by exhibiting a device which he says will convey the human voice any distance over metallic wires so that it will be heard by the listener at the other end.

He calls the instrument a "telephone," which is obviously to imitate the word "telegraph" and win the confidence of those who know of the success of the latter instrument without understanding the principles on which it is based.

The authorities who apprehended this criminal are to be congratulated, and it is hoped that his punishment will be prompt and fitting, that it may serve as an example to other conscienceless schemers who enrich themselves at the expense of their fellow creatures.—MERLE THORPE in *Scribner's Commentator*, July, 1937.

REFUSED TO BUY THE SCIENTIFIC TOY

Alexander Graham Bell was issued a patent on his telephone on March 7, 1876, and he immediately offered to sell it to the Western Union Telegraph Company, the largest, and, in fact, about the only, communications corporation in the country. Bell and Hubbard's price was \$100,000. Western Union was not interested in this "scientific toy" and contemptuously refused to buy it. Such a device could never be

used for long distance communication, which, said the directors, was the major field of the telegraph. (It has been said that a couple of years later they would have paid twenty five million dollars for the patent.)

AND—Now you can pick up your telephone and talk to any one of 30,780,000 other telephones on the face of the earth. This is 92 per cent of all the telephones in the world. Also, you may now talk to 19 steamships. You can't talk to China or Japan yet, but that is coming. Every hour 5,000,000 telephone conversations take place.—*Reader's Digest*, October, 1933.

HE GAVE HIS SHARE AWAY

Frederick Gower was a newspaper man who, with Bell, lectured on the "talking box"—the telephone. He would speak to an audience in one place while Bell was speaking to another audience somewhere else. Both would demonstrate the invention by talking with Watson, who had wire connections with them. In return for his support, Dr. Bell gave Gower a contract for the exclusive sales and installation rights in New England. However, Gower had so little confidence in the practical value of the telephone that he traded this contract back to Bell for the privilege of being the sole lecturer on it. He believed that lecturing would be more profitable than any possible commercialization of the invention.

Incidentally, the early telephones had only one instrument which was used both as transmitter and receiver. In order to assist users, the company posted these instructions near each installation: "Don't talk with your ear, nor listen with your mouth."

CONDUCTS AN UNREMITTING NERVOUS TENSION AND UNREST

In 1914, Thorstein Veblen declared that the use of the telephone "involves a very appreciable nervous strain and its ubiquitous presence conduces to an unremitting nervous tension and unrest wherever it goes."—THORSTEIN VEBLEN, "The Instinct of Workmanship, p. 316, Viking Press, 1914.

IMPOSSIBLE, AND OF NO VALUE ANYWAY

In 1865, eleven years before Bell invented the telephone, the editor of an eastern newspaper, in discussing the various reports and rumors that had been circulating for 10 years, wrote, "Well informed people know that it is impossible to transmit the human voice over wires and that, were it possible to do so, the thing would be of no value."

WOMEN ARE CROWDING OUT BREADWINNERS

Fifty or sixty years ago, when the telephone was young, the switchboards were operated by men. Women were just beginning to find their way into office positions, and it was but natural that they should begin to find their way into telephone offices as well. This movement, once it was recognized, brought a wail from the men who were being crowded out, the arguments against it being the usual, "Woman's place is in the home," and "Women are crowding out the breadwinners of the family." However, once introduced, the woman switchboard operator soon became established. Telephone users found that she was more courteous and obliging than was her predecessor.

WOMEN ARE BEING CROWDED OUT

When women began to be displaced by the automatic switchboard, they in turn began to wail. And they had at least one well-known supporter—the chief engineer of a leading telephone company who, in an address before the American Institute of Electrical Engineers, vigorously condemned the introduction of the automatic switchboard.

MADMAN, DREAMER, AND CRANK

About a hundred years ago, in reply to a general appeal by Congress for suggestions on a proposed protective semaphore line between New York and New Orleans, Samuel F. B. Morse, Professor of Art at the University of the City of New York, sent in an account of a device upon which he was working—an instrument that would send messages over a wire in a much shorter time than they could be sent by semaphore signals. His reply was ignored.

Morse continued his experiments and on September 2, 1837, exhibited and demonstrated his device at the University. A New Jersey mechanic, Alfred Vail, became interested and soon teamed up with Morse as a partner. They applied for a patent and also for a Congressional appropriation with which to build an experimental line.

At Washington, Morse demonstrated his telegraph on a line between a room in the basement story of the Capitol and the ante-room of the Senate Chamber. But Congress was skeptical. And in the ensuing debates Morse heard himself labelled a “madman,” “dreamer,” “crank,” and called several other uncomplimentary

names. Congress later adjourned without making the appropriation.

Morse then sailed for Europe. In England his patent application was refused. In France he obtained the patent, which was immediately appropriated by the government. In Russia he was unsuccessful. After a year of trying to interest foreign governments, Morse returned home and again went to Congress, which, in 1843, voted \$50,000—by an eight-vote margin.

AND—on May 24, 1844, before President Van Buren, his Cabinet and other notables grouped in the chambers of the Supreme Court, Morse sat down and sent and received the message, "What hath God wrought!" Today, 65,000 telegrams are sent every hour.

THE PUBLIC REFUSED TO BELIEVE IT

Two days after the telegraph had been demonstrated in Washington, the Democratic National Convention began in Baltimore. Nothing could have been more opportune for a demonstration of the practical value of the telegraph. Over the wire came the announcement of the nomination of James K. Polk as candidate for president. The public refused to believe it until it was confirmed by mail. When Silas Wright was nominated as vice-president a telegram was sent to him and he declined, also by wire. The convention laughed at the news and adjourned until the next day, while a committee went by train to Washington and found it was true.—ROGER BURLINGAME, "March of the Iron Men," pp. 284, 285, Charles Scribner's Sons, 1940.

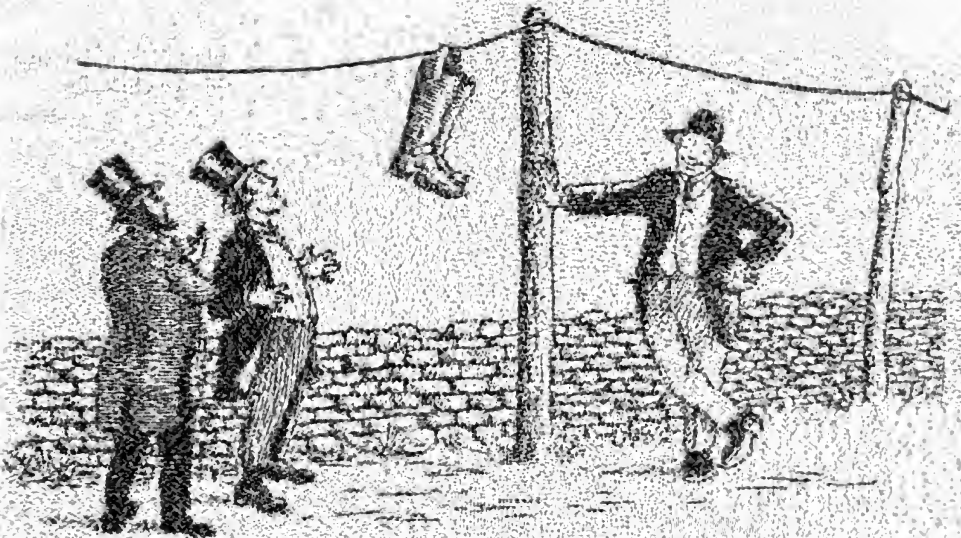
THE IDEA IS IMPRACTICAL

After Morse had offered his invention, the tele-

graph, to the United States Government for \$100,000, Congress asked the Post Office Department for an opinion, and got it—"the idea is impractical." The government, acting on this opinion, refused to buy the patent.

MAYBE HE CAN SEND THESE BOOTS, TOO

When Morse and his partners were experimenting on their telegraph line from Baltimore to Washington, they first buried the wire in leaden tubes in the ground. However, this was not successful, and they set up poles and stretched the wire on them. When everything was about ready for the first message, a face-



Let's see that lunatic send this message.

tious Baltimorean took off his boots, hooked the straps together, and hung them over the wire, shouting to a group of his highly amused friends, "If this lunatic Morse can send messages on that contraption, maybe he can send these boots to Washington, too."—The Bell

Telephone Company of Pennsylvania.

NO CONFIDENCE, NO BUSINESS

So little confidence did the public have in the telegraph that two years after the line (between Baltimore and Washington) had been installed, the receipts for one quarter were only \$203.43, at the rate of one cent for four characters.—“Technological Trends and National Policy,” p. 49, National Resources Committee, Washington, D. C., June, 1937.

THE PROFESSOR PROVED IT WAS IMPOSSIBLE

The laying of the Field trans-Atlantic cable was a glorious occasion for the scoffers—or, perhaps more accurately, a series of glorious occasions. The first attempt, in August, 1857, was a failure, the project being given up after the line had parted three times. The public scoffed with the common, “I told you so.” The following June another attempt was made, but after 335 miles of cable was laid the cable again parted. More scoffing. The undiscouraged promoters were successful in laying the complete cable between July 7 and August 5 of the same year, and messages, while not especially clear, could be heard. However, in October the cable went dead, due to a failure of the insulation. But in the following July a new cable was successfully laid and successfully used.

When the first attempt was being made to lay the cable, a well-known American physicist, professor in one of our oldest and most highly respected universities, stated that “while it may be undoubtedly possible to send a message over the cable for a short distance, it is utterly impossible to send messages for 3,000 miles under the sea.”

NOTHING OF POTENTIAL VALUE IN IT

Guglielmo Marconi, an Italian schoolboy, after listening to his teacher explain the mysterious Hertzian waves, asked, "Why cannot messages be sent over these waves like we now send them over a telegraph wire?" For reply, his teacher smiled indulgently.

Excited by the idea, young Marconi went to work and soon, with an outfit consisting mostly of two 10-plate aerials, a telegraph key, and a remodeled telephone receiver, was transmitting not-very-clear dots and dashes across his father's garden. After three years of experimentation, the 21-year-old youth offered his fairly successful device to the Italian government, but the government found "nothing of potential value in it."

The next year, 1896, Marconi took his device to England, demonstrated it, and received the first wireless patent.

HE LET IT LAPSE

Even when, in 1907, DeForest put the radio tube in workable form at the same time that others had made like inventions independently, he was unable to sell his patent and let it lapse rather than pay \$25 for its renewal.—P. G. AGNEW, "Harnessing Scientific Discoveries," *Scientific Monthly*, vol. xi, p. 170, 1935.

UNRECOGNIZED IN AMERICA; RECOGNIZED IN EUROPE

Eighteen-year-old Philo T. Farnsworth, while a student at Brigham Young University, developed the basic idea of television but was unable to obtain financial backing for his experiments. A year later he went to San Francisco and was successful in interesting George Everson, who provided the necessary funds

with which to build the first models. Then Everson set about to find financial backers so that Farnsworth could continue his work. And this was a tough job because Farnsworth was only an unknown, while the great radio and electrical corporations had staffs of recognized experts and millions in financial assets. But, finally, Everson was successful—and so was Farnsworth. However, the American companies were skeptical, and the discouraged Farnsworth went to Europe in 1934, where he immediately interested two great concerns—the Goertz-Bosch-Fernsch Company in Germany and the Baird Company in England. By 1935 Philco was the only major licensee in America.—From T. R. CARSKADON, "Phil the Inventor," *Collier's*, October 3, 1936.

TELEVISION TOM PEEPS AT HER

An interesting phenomenon that invariably marks the debut of new inventions has again made its appearance. New York television engineers report that certain people are complaining that the invention has become a menace. Most of the complainants are women, who believe that someone is spying on them via television, or trying to take away an inheritance. One young woman insists that a television Tom peeps at her whenever she takes a bath.—Editorial, *Galesburg (Illinois) Register-Mail*, January 22, 1937.

YOU CAN'T FOOL ME

Peter the Voder, a remarkable machine developed by the Bell Telephone laboratories, was recently exhibited at both the San Francisco Exposition and the New York World's Fair.

This electrical device looks like an old-time parlor

organ and is played by an operator, who, incidentally, must be trained for a year before he can successfully operate it. This machine "fakes" or duplicates the singing or speaking voices of man, woman, or child—any character from hillbilly to Newport dowager; it can carry on a conversation, ask and answer questions, state facts, emphasize words; it can imitate birds, animals, and even ghosts.

Many and many a time during the demonstration of this scientific novelty at the two great fairs, wise-aces were heard to express this sentiment: "You can't fool me. That's a fake. The organ stuff is only a blind. They've got real people and animals hooked up to it with microphones and loud speakers." And, undoubtedly, this sentiment was thought, but unexpressed, by thousands of other listeners.

I KIN READ WRITIN'

The story is classic of the Kentucky mountaineer who returned his first typewritten letter to the man who wrote it, with the words indignantly scribbled on the margin, "You don't need to print no letters for me. I kin read writin'." This particular yarn cannot be justified, but there are plenty of similar cases. J. P. Johns, a Texas insurance man and banker in the seventies, gives the following transcript, from memory, of a reply once received from one of his agents to one of his first typewritten letters:

"Dear Sir:

Received your letter and will act accordingly.

There is a matter I would like to speak to you about. I realize, Mr. Johns, that I do not possess the education which you have. However, until your last letter I have

always been able to read the writing.

I do not think it was necessary then, nor will be in the future, to have your letters to me taken to the printers, and set up like a handbill. I will be able to read your writing and am deeply chagrined to think you thought such a course necessary."—"The Story of the Typewriter," Herkimer County Historical Society, pp. 74, 75, Herkimer, New York, 1923.

PLAYING ON THE LITERARY PIANO

The weary process of learning penmanship in the schools will be reduced to the acquirement of writing one's own signature and playing on the literary piano.—*Scientific American*, July 6, 1867.

USE IT OR QUIT

William Ozmun Wyckoff, who later became a partner in the new firm of Wyckoff, Seamons & Benedict, exclusive agents for the typewriters produced by E. Remington & Sons, was a court reporter in Ithaca, New York. Seeing one of the typewriters, he appreciated how it could be used in his line of work, and ordered several for the use of the clerks and helpers in his office. By means of these devices, he theorized, the records would be legible, neat, uniform, and could be made rapidly. But he encountered opposition at once; every member of his staff rebelled against the use of the new machines. Wyckoff immediately said, "Use it or quit." They used it.

TWENTY-FIVE CENTS FOR TYPEWRITTEN NOTES

The first practical typewriter, invented by Christopher Latham Sholes and Carlos Glidden, was patented on July 14, 1868, and manufactured commercially for the first time in 1873. However, it attracted

little attention; most people considered it merely a novelty with no future. Even one of the inventors indicated a lack of confidence in its possibilities when he suggested that probably the device would be limited largely to pastors in writing out the notes for their sermons.

Models of this to-be-manufactured "Type-Writer" were exhibited in New York in 1871 and 1872, but they turned out to be not-very-interesting curiosities. The Remington Model 1, highly ornamented with mother-of-pearl and mounted on a fancy sewing machine stand, was exhibited first at the Centennial Exposition at Philadelphia in 1876. It wrote only capital letters, and the carriage return was operated by a treadle. Visitors paid 25 cents to have a brief note typed on it, either to keep as a curio or to be sent back home to their friends. The public was curious, but little real interest was aroused. Few machines were sold. The general attitude of the public was expressed by one individual in these words: "I can write, and I can buy a pen for a cent that will write all sorts of letters and numerals; why should I pay more than \$100 for a machine that will write only capitals?"

THE FEMALE CONSTITUTION WILL BREAK DOWN

For about a decade after the "Type-Writer" was placed on the market, one of the greatest problems confronting the manufacturers and promoters was that of competent operators. Obviously, there were no courses in typing available. Remington, the first commercial manufacturer, organized its own schools, and even, in some instances, when it sold a machine, also furnished an operator for it.

The enterprising head of the Business School of the

New York Central Y.W.C.A. obtained machines and announced that courses in typing would be open to women. Public opposition was immediately aroused. The proposed plan was called "an obvious error in judgment," and the directors of the school were labelled "well meaning, but misguided ladies." The main reason given for this vigorous opposition was that "the female mind and constitution will break down under a course involving incessant pounding that lasts for six months." However, eight "strong women" were found, induced to enroll, and after being graduated in 1881 easily found positions.

Naturally, following this successful demonstration of typewriting instruction, girls and women, recognizing the vocational possibilities of the new invention, flocked into these courses, much to the disgust of business men who had always had male help in their offices. But it was not until years later that the "female operators of the Type-Writer" became well established in their positions.

IV

INDUSTRY

NOT WORTH A FARTHING

James Watt, the University of Glasgow's instrument maker, while repairing a classroom model of Newcomen's vacuum engine, was struck with the idea of an engine run by steam. Ultimately he made a model, patented the idea, and interested John Roebuck, owner of the Carron Iron Works, in building it.

This engine was never finished, and later Roebuck went bankrupt. His creditors took everything he owned—except the engine, which they considered was “not worth a farthing.” They allowed Watt to have it. Later, Watt, in partnership with a man named Boulton, produced the engine, which was so successful that both men became rich.

TOO YOUTHFUL AND INEXPERIENCED

In 1789 Joseph Bramah, one of England's most famous inventors, designed a new type of lock. However, lacking the necessary tools and machinery, he could not produce it in sufficient quantity to sell at a low price. He looked around for a mechanic and had recommended to him a young worker, Maudsley, at the Woolrich Arsenal. He sent for Maudsley.

However, when Maudsley walked into Bramah's office, the latter was amazed to find him little more than a boy. Bramah took one look and then dismissed

him with the remark, "You are too youthful and inexperienced to be of assistance to me." Maudsley went back to his arsenal job.

Later some of Maudsley's fellow workers went to Bramah, told about their friend's work, and insisted that he give the young man a chance. Bramah reluctantly agreed, employed him, and found to his astonishment that his new employee was a genius. Together the two designed and developed the slide rest, a most important invention, one upon which the tool-cutting industry of today rests.

MIGHT AS WELL SAIL WITH A CARGO OF WATER

Frederick Tudor was an up-and-coming young merchant of Boston who dabbled in almost everything that would return a profit. A friend told him about the possible uses of ice in Martinique, so he went to an old sea captain and said he wanted to send a shipload of ice to Martinique.

The captain looked at the young man a moment, and then scornfully bellowed: "Ice! Why, blow me, d'ye want to swamp my ship? I might as well sail with a cargo of water." However, young Tudor persisted, and finally the captain agreed. The ice was packed in sawdust and sent to the West Indies. The trip was so successful that Tudor soon had an established business in shipping ice. A bit later he shipped it even to India.

A CAPITAL OFFENSE TO BURN COAL

In the days of King Edward I, it was a capital offense to burn coal in London. In 1619 the growing scarcity of wood led Dudley to attempt the substitution of coal for charcoal in his blast furnace. The iron

masters drove him out of Worcester County. He set



up another furnace. A riot was organized and the furnace was wrecked. Only 150 years ago it was as iniquitous to sell coal in Philadelphia as it is to sell liquor there today.—Adapted from ARTHUR D. LITTLE, "New Lamps for Old," *The Technology Review*,

That'll learn him.

October, 1931, Massachusetts Institute of Technology.

TO NO PROFITABLE PURPOSES

Henry Cort, in 1783 and 1784, took out patents on the use of coal in forges and on the processes of puddling, but his ideas were ridiculed by iron and steel manufacturers, and, unable to find a financial backer for his projects, he went bankrupt. More than 20 years later an official report by the British government had this to say about Cort's patents: "It does not seem that any opportunity has occurred, though endeavors have been used, to make them available to any profitable purposes."

RIOTS! RIOTS! RIOTS!

James Hargreaves invented the spinning jenny, a

machine which would spin more than one thread at a time, in 1767. At first he substituted eight spindles for one, and later eighty for the eight. Desiring to capitalize on his invention, he built a mill and installed a number of his machines. Opposition flared up immediately, and finally angry mobs demolished his mill and destroyed his machinery.

John Kay, the inventor of the fly-shuttle, set up a mill at Leeds, but his mill was destroyed, and he was driven from the city. He then returned to his own home town, Bury, and built a new mill. But popular suspicion and hatred followed him there. A mob destroyed his mill, broke into his home, smashed all his furniture and implements, and attempted to kill him. He was similarly persecuted in France. Later he returned brokenhearted to England and died there in utter poverty.

Joseph Marie Jacquard was laughed at for attempting to devise a machine that would tie a knot in a stretched string—the basic principle of the loom. Finally, he succeeded, and then built and installed a number of full sized machines at Lyons. But the people in a great demonstration, dragged one of his machines to the public square, destroyed it, and threatened Jacquard's life.

About 1579 the Council of Danzig sentenced the inventor of a crude weaving machine to be strangled, lest many workers be reduced to beggary because of this new invention.

COULDN'T SELL A SINGLE RATTLE-TRAP

In 1786 Oliver Evans was granted rights on steam-driven flour-mill machinery in Pennsylvania, and in the next year in Maryland. However, when he attempted to

sell his device, not a single miller in Pennsylvania, Maryland, Delaware, or Virginia would purchase such "rattle-traps."—C. W. MITMAN, "The Beginning of the Mechanical Transport Era in America," Smithsonian Institution Annual Report, 1930, p. 531, Washington, D. C.

THE BIGGEST MAN-MADE EXCAVATION ON EARTH

Several years after the Civil War the sons of Lewis H. Merritt recalled that a number of years previous their father had staked out and worked a "gold claim" near Duluth—a claim that produced only "fool's gold" (iron pyrites) and red ore—and decided to try to locate the iron ore again. These brothers and their three nephews, who soon became known as the "seven Merritt brothers," were considered fools, and when they located the ore and attempted to organize a company to dig it out, they were called "bunco artists," "tricksters," and other names of shady implication.

However, they knew that iron was there and engaged a mining engineer from England to assist them. He came and looked over the site, and then told them: "You'll never be able to sink a shaft! The sides will cave in."

The Merritt Brothers listened to his discouraging report, and then one of them had an idea: "Why should we sink a shaft at all? Why can't we dig the ore right out of the ground with steam shovels?"

This was an unheard-of idea to the mining engineer. He protested that it was impossible, resigned, and returned to England.

But digging the ore was not their only difficulty. There was no way in which the ore could be shipped

out, once it was dug, since the site was not near a railroad. When the Merritts began to campaign for financial help to build their own railroad to the Mesaba Range, the people of Duluth called the whole plan "absurd"; and the city of Duluth refused to allow their city to be used as a terminal for the ore-carrying trains.

BUT—overcoming the many obstacles, the Merritts in 1893 sent out their first train load of steam-shovel-dug iron ore, and today the Mesaba Range—the greatest ore producer in the world (some 50,000,000 tons a year)—is the scene of the largest man-made excavation on the face of the earth, rivaling even the Grand Canyon in size.

PHOOEY! ONLY A PAPER ENGINE!

Rudolph Diesel, who, as a student in trade and technical schools had made a brilliant record, was the Paris agent for Linde's ice-making machine. But his off-duty thoughts were about a new type of engine. He knew that the more you compress air the hotter it becomes, and he estimated that if it could be compressed to about one-sixteenth of its original volume its temperature would be around 1,000 degrees Fahrenheit. Now, thought he, if a drop of oil were injected into the compressor it would be immediately ignited and would drive the piston back. No other system of ignition would be necessary.

Instead of experimenting, this 35-year-old engineer thought out and drew the plans for his engine, down to the smallest detail, and published them (in 1893) in a booklet entitled, "Theory and Construction of a Rational Heat Motor." His idea was received "with coldness and ridicule" as he later wrote, and his

device was tagged "a paper engine" because it existed only in a pamphlet. But he persisted, and finally interested Krupp. In August, 1893, Diesel's first engine was tested—and it exploded. Diesel, who narrowly escaped death, jumped off the floor and shouted, "That's what I wanted to know. It proves I am on the right track." Four years later his new 20-horsepower motor astounded a group of famous engineers at Augsburg.

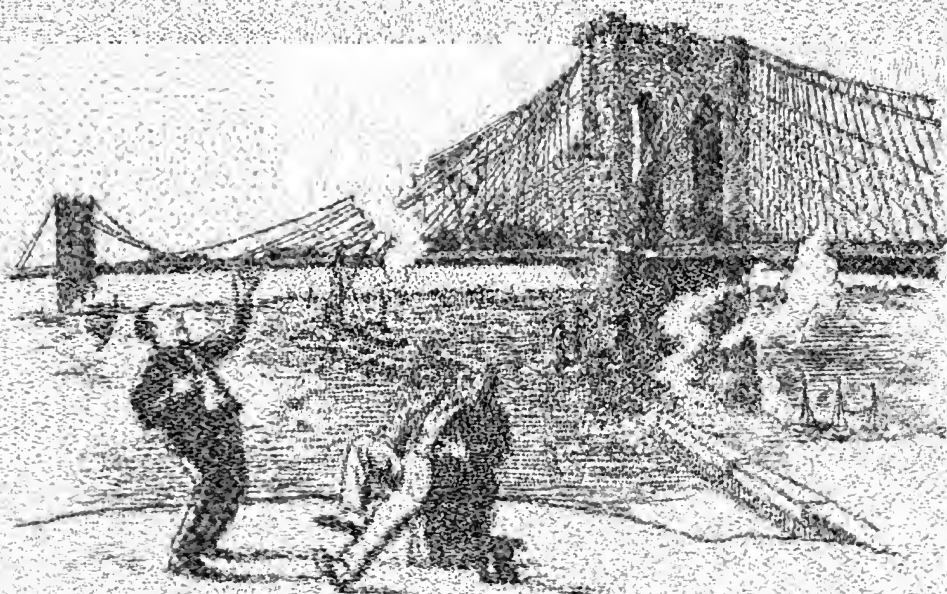
And today the descendants of this "paper engine" are found in automobiles, trucks, busses, airplanes, tractors, locomotives, ships, submarines, generators, refrigerators, and dozens of other modern devices. In 1932, 100,000 "diesel horsepower" was sold, in 1938, 2,144,000. This amazingly efficient and economical engine will run on almost anything; it has been run on castor, fish, and peanut oils, powdered coal, melted asphalt, and even buttermilk!—From HARLAND MANCHESTER, "Forgotten Inventor," *The Toronto Star Weekly*, February 11, 1939.

ROPE-BELT DRIVES MUCH MORE FEASIBLE

In the 1880's a very brainy English engineer, Osborne Reynolds, wrote a paper in which he proved conclusively that electricity could never be a practical form of power, for transmission losses would be too great. Transporting this form of power a few miles was quite out of the question. He proved that it was much more feasible to use rope-belt drives running from pulley to pulley, the power lines being strung for miles across the country. . . . It is now feasible to transmit electric power 200 miles or more.—C. C. FURNAS, "The Next 100 Years," p. 217, The Williams and Wilkins Company, 1936.

STUPID AND IMPOSSIBLE

John Augustus Roebling—an architect, engineer, philosopher, and musician—who came from Germany in 1831, became interested in wire rope and with it, in 1845, carried a canal across the Allegheny River. Later he built a suspension bridge across the Monongahela River at Pittsburgh, which, much to the surprise of everyone, “stayed up.” In 1851 he contracted to build a double roadway suspension bridge across the Niagara River below the Falls—“a stupid and impossible project,” said eminent engineers. In 1855 when the bridge was officially opened, thousands of people gathered expecting to see it collapse and fall into the



What a splash it'll make!

river. Even when it “stayed up,” they were fearful of crossing it because it was “too much like taking your life in your hands.”

Twelve years later, at Cincinnati, Roebling com-

pleted the newest "longest suspension bridge in the world" with a center span of 1,057 feet.

For nearly 20 years Roebling had been trying to get into official heads the idea of a suspension bridge across the East River from Brooklyn to Manhattan. He finally was successful and drew up the plans. However, in 1869, while making a preliminary survey, his foot was crushed, and 18 days later he died from tetanus. But his son, Washington Augustus Roebling, carried on, and in 1883 the Brooklyn Bridge, with a center span of 1,595 feet, was formally opened by President Chester A. Arthur. And the predictors of disaster? Wrong again.

AND—on July 9, 1929, the construction of the giant Hudson River Bridge began. From 635-foot steel towers on either side of the river, run four three-foot cables, each composed of 61 strands, each of which is made up of 434 wires—a total of 107,000 miles of steel wire. These cables carry 90,000 tons of dead weight. And they contain more wire than is to be found in the world's next seven longest suspension bridges. The center span is 3,500 feet long. Once again the prophesiers of doom were wrong.

IT CAN'T SEW THE SOLES

Stitching leather to make shoes by a device adapted from the sewing machine of Elias Howe was first tried in the early fifties. It was a success and shoe manufacturers installed the machines. No machine was available for stitching the hard soles to the uppers, and consequently this remained a hand process. However, in 1857 a cobbler named Lyman R. Blake, of South Abington, Massachusetts, invented a sewing machine which successfully sewed the heavy leather

soles. Unable to finance his invention, he looked around and finally interested Gordon McKay in the possibilities of his machine. McKay built a number of the machines but was unable to persuade the manufacturers, who were certain that "no machine can do as good a job as human hands," to install them, and McKay lost his entire fortune.

The Civil War came on and with it an unprecedented demand for shoes. The industry was considerably disorganized because many shoemakers had been enlisted in the army. So the manufacturers, in order to meet this demand, turned again to McKay, and his machine became an immediate and lasting success in the shoemaking industry.

NO FUTURE IN FRUIT CANNING

About 135 years ago a poverty-stricken Englishman, William Underwood, with a fantastic notion, arrived in New Orleans. He had heard about how, during the French Revolution, an obscure confectioner, Nicholas Appert, had developed a method of preserving food for the soldiers, many of whom were dying because their only food was salt pork and bread. So Underwood, recognizing the amazing commercial possibilities of preserving summer foods for winter use, worked out his ideas and came to America to develop the food-preserving business.

Underwood took his plans and his samples of preserved foods to a number of industrialists and bankers in New Orleans, but they only scoffed at his ideas. They could see "no future in such a business, except on so small a scale as to be unprofitable." Underwood had determination, even if he had no money, and so he walked all the way from New Orleans to Boston,

trying to enlist financial support on the way.

Finally he arrived in Boston, still unsuccessful, but still undiscouraged. At Boston he was successful in raising a small amount and with it he established an unpretentious cannery, where he began by putting up fruit in bottles. His business in fruit began to expand, and then he turned to vegetables, some of which, such as the tomato, were soft and spoiled soon. In time, after many discouraging disappointments, he was successful. Then he turned to experimenting with sea food, and he faced ridicule, but again, in time, he was successful.

AND—today the yearly production of 75 millions of cases of canned fruits (80 per cent of which come from the United States and its possessions), and other millions of cases of canned vegetables, are evidence that the crazy idea of the determined fool, William Underwood, was sound.

THE CRAZY BABY SAVER

In 1851 an American was returning from England on an immigrant ship—a ship on which were many babies, and cows with which to feed them. The sickness and death toll of these small children was high because of the dirty and soon-souring milk. The American considered the distressing sights about him and then told the captain that he was going to try to find a way to preserve milk so it, instead of the filthy cows, could be carried on ships.

“What!” exclaimed the captain, “A ship without cows? Why man alive, it can’t be done. You’re crazy.”

But Gail Borden stuck to his idea, and later the village of New London, New York, carried on his

experiments in preserving milk. Finally, after two years of disheartening work, he was successful in boiling out the water and hermetically sealing the condensed portion of the milk.

AND—since then, hundreds of thousands of babies have continued to live through the efforts of this kindly Gail Borden, one of the world's greatest benefactors.

WILL CRACK ALL THE PLASTER

When Buffington took out patents for the steel-framed skyscraper in 1888, the *Architectural Record* predicted that the expansion and contraction of iron would crack all the plaster, eventually leaving only the shell.—GRACE POLK, Sire of the Skyscraper, *New York Times Magazine*, November 21, 1926.

FOOLS USED THE USELESS

Formerly, overburned and underburned bricks were thrown away or sold at low cost. Then one day a fool bought a load of these almost worthless bricks, took them home, and built a wall out of them. His neighbors jeered at him, but he continued his work and was amazed at the pleasing results of his project. He rushed back for more bricks to complete his house. Then his neighbors, appreciating the artistry of his many-colored walls, began to purchase the useless bricks. And, shortly thereafter, the brickyards began to make "tapestry bricks"—and charge high prices for them.

In an early day cypress was widely used in the manufacture not only of furniture but also of various kinds of interior woodwork. The price of cypress lumber was high, however, because much of it had

wormholes. A foolish cabinetmaker had a different idea. He made a piece of furniture with the discarded lumber and discovered that it was really attractive. So a market for the formerly discarded worm-eaten lumber appeared. And now, in the manufacture of antiques, worm holes are actually burned into the wood.

OF NO PRACTICAL VALUE WHATEVER

In 1889 a Frenchman by the name of Amoit invited his friends to see his new invention—a small platform which, operated by water power, moved slowly up a circular track.

Some of his amused friends rode up and down on his moving stairway, and asked what he planned to do with it. When he suggested the possibilities of its use in homes, stores, and other buildings, they laughed at him. They admitted that it was “an unusual, and delightful overgrown toy,” but contended that it was of no practical value whatever.

WE WILL NEVER BUILD THEM

Charles Richardson Pratt, while working with the Whittier Machine Company of Boston in 1888, designed and built the first electric elevator, installing it in the old Tremont House at Boston. Three years later, while associated with Frank J. Sprague, he designed and built an electric elevator for the Grand Hotel, New York. Later, he tried to interest the president of the Otis Elevator Company, that built hydraulic elevators, in his invention, but Otis Elevators were not interested in the idea. Said the president: “No elevator we ever build will be run by electricity.” However, several years later this same company

bought out the electric elevator business of the Sprague Company.

TAKE AWAY ARTISTRY AND DIGNITY

In 1857 the first "patent paints," ready-mixed paints, were placed on the market. Previous to this time all painters bought the ingredients and mixed their own paints. Naturally there was much opposition to the introduction of patent paint. The old-time painters opposed it because, they said, it would undoubtedly be an adulterated and cheapened paint. Too, some of them opposed it because its use would, as one of them stated, "take away the artistry and the dignity of the painting profession."

A MONTH TO PAINT A CAR

In an early day it required about a month to paint a car. A certain manufacturer, realizing that his dream of speedy mass production of automobiles would have a "bottle-neck" in the paint shop, called in his paint experts and asked them to produce a paint that would dry in an hour. "Impossible," they exclaimed, "anyone knows that paint cannot under any conditions dry that fast." However, he released several of the best of them from other work and assigned them to the job of developing the impossible quick-drying paint. The ultimate result was a durable, quick-drying enamel, several coats of which can be sprayed on within an hour.

IS JOHN BULL'S FACE RED?

Some 25 years ago the British discovered oil in southern Persia, now Iran, and the ruler of Arabia, wondering if there wasn't oil in his country, tried to

interest them in it. But, having been told by their geologists that there was no oil in that part of Arabia, they refused to become excited. The Arab representative to London ran across Major Frank Holmes who, after consulting reports and books, decided that the possibilities were attractive and went to Bahrein, a desert island off the East coast of Arabia. However, the Shiek of Bahrein was interested in water, not oil. So Holmes drilled two wells, found water, and got a contract for 20 additional wells, and also the oil concession. Despite the advice of his four geologists, Holmes returned to London and attempted to interest British capital. Unsuccessful, he asked for and obtained permission to attempt to interest American capital.

The Gulf Oil Company's geologist went to Bahrein and returned with a report of excellent prospects. However, because Andrew Mellon (Gulf's owner) was Ambassador to England, his company, in order to avoid political entanglements, lost interest. Holmes again went to London and again was unsuccessful in obtaining financial support. He returned to America and interested Standard Oil of California, to which Gulf sold its rights for \$50,000.

AND—in June, 1932, Standard Oil of California struck oil in Bahrein at 2,008 feet, and was soon refining 30,000 barrels a day—a \$100,000,000 (or more) bit of "foolishness."—From JEROME BEATTY, "Is John Bull's Face Red?", *The American Magazine*, January 1939.

WHO EVER HEARD OF A CURVED OIL WELL?

H. John Eastman, unemployed salesman who, because of the depression, had become a laborer in the

oil fields, was intrigued with the idea of a device that would help drillers keep oil wells "straight"—that is, not varying more than three degrees from the perpendicular. Successful in this, the thought struck him, "If we can straighten wells, why can't we drill them crooked?" Such a procedure could drill wells under the ocean, parks, cemeteries, and similar settings where derricks were costly or undesirable, "detour" around hard formations, drill in below the fire in burning wells, and maybe, even, drill more than one well from the same derrick. But this idea of this "untrained, inexperienced, ex-salesman-roustabout" was ridiculed by professional oil engineers.

Undiscouraged, however, Eastman developed his device—which consists of a long metal cylinder containing compass, plumb bob, camera, and batteries, a "whipstock" which can be fastened at the desired angle in the well, and a bit which works inside this.

AND—"Controlled Directional Drilling," as Eastman called his process, soon became established in the oil industry.—Adapted from *Reader's Digest*, August, 1939.

V

LAND TRANSPORTATION

FOUR FOOLISH PROPHETS

700 YEARS AGO

I will now mention some of the wonderful works of art and nature in which there is nothing of magic and which magic could not perform. Instruments may be made by which the largest ships, with only one man guiding them, will be carried with greater velocity than if they were full of sailors. Chariots will be constructed that will move with incredible speed without the help of animals. Instruments of flying may be formed in which a man, sitting at his ease and meditating in any manner, may beat the air with his artificial wings after the manner of birds . . . as also machines which will enable men to walk at the bottom of the seas or rivers without ships.—ROGER BACON.

500 YEARS AGO

Carriages without horses shall go,
And accidents fill the world with woe.
Around the world thoughts shall fly,
In the twinkling of an eye.
Water shall yet wonders do,
Now strange, shall yet be true;
The world upside down shall be,
And gold found at the root of a tree.
Through hills man shall ride,
And no horse or ass be at his side.

Under water men shall walk,
Shall ride, shall sleep, shall eat, shall talk.
In the air man shall be seen,
In white, in black, in red, in green.
Iron in the water shall float,
As easy as a wooden boat.
Gold shall be found under stone,
In a land that's not now known.
Fire and water shall more wonders do,
England shall at last admit a Jew.

So wrote, five centuries ago, Mother Shipton, a queer old English lady who was popularly supposed to be a witch.

150 YEARS AGO

Soon shall thy arm, unconquered Steam, afar
Drag the smooth barge, propel the lumbering car;
Or on wide-waving wings expanded bear
The flying chariot through the fields of air.
Fair crews triumphant, leaning from above,
Shall wave their flutt'ring kerchiefs as they move,
Or warrior bands alarm the gaping crowd,
And armies shrink beneath the shadowy cloud.

So prophesied Dr. Erasmus Darwin, grandfather of Charles Darwin, the English scientist-poet. Undoubtedly he knew about the experiments of James Watt, but the application of steam to transportation through the locomotive and steamboat was unheard of. And, of course, he had never seen an airplane.

140 YEARS AGO

"The time will come," wrote Oliver Evans, the builder in 1803 of an enormous steam device which he drove through the streets of Philadelphia, "when peo-

ple will travel in stages moved by steam engines from one city to another, almost as fast as birds can fly, fifteen to twenty miles an hour. A carriage will set out from Washington in the morning, the passengers will breakfast in Baltimore, dine at Philadelphia, and sup at New York."—*Niles Weekly Register*, 1812.

THE RAILROAD

COME DIRECTLY FROM THE DEVIL

It may be that the automobile or the locomotive appeared much earlier than the usual accounts of the first steam operated vehicles seem to indicate. At least, in the Nurnberg Chronicle in 1398, there appeared a diatribe which blasted at the "wheeled engines performing strange tasks and shows and follies, devices which come directly from the Devil."

THIS UNTAUGHT GENIUS WAS MAD

When the word about George Stephenson's "fool notion" of building a railroad from Liverpool to Manchester got around, the leading scientific councils openly declared that this "untaught and inarticulate genius," Stephenson, was mad. Ministers met in Manchester and declared the locomotive "in direct opposition both to the law of God and to the most enduring interests of society." Medical societies declared that "the air would be poisoned and birds would die of suffocation." Landowners were sure that the preservation of foxes and pheasants would be no longer possible. Householders were certain that their houses would be burned down; horse breeders, that horses would become extinct; farmers, that oats and hay would be rendered unsalable; innkeepers, that

inns would be ruined; passengers, that boilers would burst. The prominent English surgeon, Sir Astley Cooper, who had been knighted by King George, solemnly warned Parliament as follows: "You are entering upon an enormous undertaking. . . . You will in a very few years destroy the nobility." No reputable engineer would appear before the Parliament Committee to testify in favor of the locomotive.

Stephenson persisted and set about surveying for his railroad. Lord Derby turned out his farmhands to chase Stephenson's surveyors off his estates. Lord Sefton did likewise, and the Duke of Bridgewater threatened to shoot them on sight. Stephenson had his surveying instruments smashed so often that he hired a prize fighter to carry them. Parliament passed a law forbidding the laying of track, and Stephenson was arrested and put in jail.—MERLE THORPE, *Scribner's Commentator*, September, 1937.

COVERED WITH TEAKETTLES

Colonel Sibthorp denounced Stephenson and all his class as something less respectable than highwaymen; and there were thousands of less responsible beings who were very much of the same opinion as the Newcastle mail-guard, who, beholding his occupation going with the incoming of the locomotive, lamented it was all over with England if she was "to be converted into a gridiron and covered with teakettles."—JAMES BURNLEY, "The Romance of Invention," p. 284, Cassell & Company, 1886.

FASTER THAN STAGE COACHES? RIDICULOUS!

When the Woolwich railroad line was projected, the

Quarterly Review, a substantial and highly respected publication, scornfully asked: "What could be more palpably absurd and ridiculous than the prospect held out of locomotives travelling twice as fast as stage-coaches? We should as soon expect the people to suffer themselves to be fired off upon one of Congreve's rockets as trust themselves to the mercy of such a machine going at such a rate."

SPEED LIMIT—SIX MILES AN HOUR

C. Crozet in 1826 declared that "a rate of speed of more than six miles an hour would exceed the bounds set by prudence, though some of the sanguine advocates of railways would extend this limit to nine miles an hour."—GEORGE AMROYD, "A Connected View of the Whole Internal Navigation of the United States," Philadelphia, 1830.

BURN THEIR PARASOLS!

Some of the other arguments against the locomotive and the railroad were:

Sparks from the locomotive would fall on the ladies' parasols and burn holes in them.

The "flaming stacks" would set fire to the countryside.

Cattle would go into convulsions.

Hens would stop laying eggs.

If the speed ever exceeded fifteen or twenty miles an hour, the passengers would die, since "the human body is incapable of surviving such breath taking speed."

"No engineer in his senses would think of such a thing!"—(Mr. Francis Giles, C.E.).

TOST, TUMBLED, RUMBLED AND JUMBLED

The first regular railway cars were called "whirlcotes." They were ridiculed, not only because of their strange shape and appearance, but also because they were uncomfortable to ride in. One Taylor, a poet, described them as machines in which people were "tost, tumbled, rumbled, and jumbled without mercy."

NAMES AND NAMES

Such names as the following give some idea of the public's evaluation of the early locomotive: "Hell on Wheels," "Devil Wagon," "The Teakettle," "Puffing John Bull," "Black Dragon," "Tom Thumb," and "Snorting Race Horse."

BAD FOR THE BRAIN

After studying the question at great length, the Royal College of Bavarian Physicians sagely announced that "riding on railroad trains will superinduce brain disease."

Another group of experts "proved" that if trains went at the frightful speed of fifteen miles an hour, blood would spurt from the travelers' noses. And further, that the passengers would suffocate going through the tunnels.

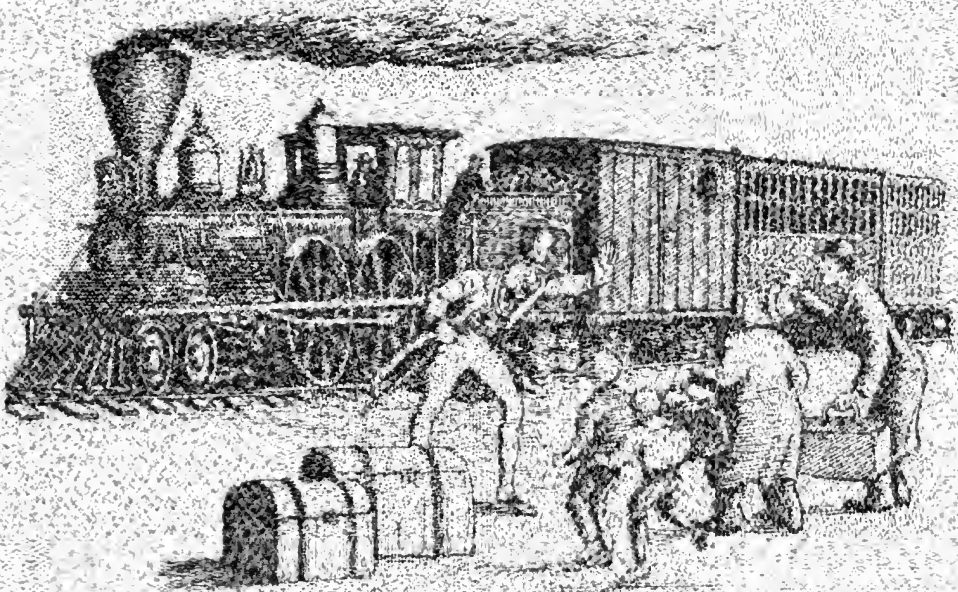
UPON MY SOUL, NO

The aged John Randolph of Virginia, famous American statesman and Minister to Russia, had been invited to take a ride on a train. He was suspicious and distrustful of this newfangled contraption that went 13 miles in 65 minutes, so he refused the invitation with, "Ride on that thing. . . upon my soul, no!"

LEAD IMMORTAL SOULS DOWN TO HELL

When the citizens of once prosperous Grand Detour, Illinois, refused to allow the railroad to come through, the town died industrially. It stands today practically as it did 80 years ago . . . and is now only a favored spot for antiquarians and artists. Incidentally, it was here that, 100 years ago, the steel plow industry, fathered by Major Leonard Andrus, was born.

In 1828 some of the citizens of an Ohio city wanted to use the local schoolhouse for a meeting in which to



No! No! Not on that!

promote the routing of a railroad through the community. In reply to their request, the school board wrote them as follows:

"You are at liberty to use the schoolhouse to debate all proper questions, but such things as railroads and

telegraphs are rank infidelity and are impossible. If God had wanted His intelligent creatures to travel at the frightful speed of sixteen miles an hour by steam, he would clearly have foretold it through His holy prophets. It is a device of Satan to lead immortal souls down to hell."

MORE INSANE ASYLUMS NEEDED

An eloquent divine in the United States went so far as to declare that the introduction of the railroad would require the building of many insane asylums, as people might be driven mad with terror at the sight of locomotives rushing across the country with nothing to draw them.—A. C. LAUT, "The Romance of the Rails," vol. 1, page 40, Robert M. McBride & Company, 1928.

BETTER HITCH MY HORSES TO IT

Folks had come from near and far to see the strange machine that had been brought on a canal boat to Honesdale, Pennsylvania, and they yelled derisively as the workmen pushed the "iron horse" off onto the track. "Better hitch my horses to it," yelled one farmer, and the crowd howled in glee. The men kept at their work, built a fire in the contraption, and at a signal the wheels began to turn slowly, and the "iron horse" moved off. It moved slowly, to be sure, but it moved, and kept moving for three miles, the length of the track. This, in August, 1829, was the trial run of the first steam locomotive in America.

HAVE TO SPROUT WINGS

Shortly after Peter Cooper's little steam engine, "Tom Thumb"—commonly known as "The Teakettle"—had hauled a small train at a speed of something

over ten miles an hour, railway promoters began to talk about a transcontinental line clear across the United States. To this insane idea the wiseacres shouted: "Bosh! The iron horse may be able to pull a train on level ground, but it would have to sprout wings to get over the mountains. It can't be done."

BUT—at Promontory Point, Utah, on the 10th of May, 1869, two decorated, balloon-stacked, smoking locomotives—No. 119 from the Atlantic and No. 60 from the Pacific—puffed slowly towards each other, touched cowcatchers, and this telegram to President Grant announced that the dream had come true: "The last rail is laid! The last spike driven! The Pacific Railroad is completed! The point of junction is 1,086 miles west of the Missouri River, and 690 miles east of Sacramento."—R. M. DEVENS, "Great Events of the Greatest Century," p. 642, published by Hugh Herron, Chicago, 1885.

NO LADIES ON STEAMBOATS OR IN RAILROAD CARS

"Steam interferes with the comfort of traveling." philosophized Samuel Brock, who died in 1862. "It destroys every salutary distinction in society and overturns by its whirligig power the once rational, gentlemanly, and safe mode of getting along on a journey. Talk of *ladies* on board a steamboat or in a railroad car! There are none. To restore herself to her caste, let a lady move in select company at five miles an hour."—DONALD G. MITCHELL in "American Lands and Letters," *Reader's Digest*, May, 1938.

SHOW THIS YOUNG LUNATIC OUT

With the improvement of locomotives and tracks, train speeds began to increase with the inevitable

result that accidents became more common. By 1860, the stopping of trains was really a serious problem. Flagmen, posted at important crossings and brakemen stationed at the rear of each coach and operating handbrakes at the engineer's whistle, were unsuccessful. Steam brakes operated by the engineer, in the form of worm gears, rods, chains over drums, and other devices were likewise unsuccessful. Accidents and collisions continued to increase.

After being in a collision while on his way from Schenectady to Troy, young George Westinghouse began to consider possible methods of stopping trains, and finally came to the conclusion that each car would have to have its own power-operated brake. But steam, he knew, would not serve because it would condense, freeze in winter, and the engine could never supply all that would be required. While thinking about the matter, he read an account of a compressed air drill and jumped to his feet shouting, "This is it! Compressed air!"

Westinghouse thought the idea through, sketched it, and then built his model. He took it to several railroad officials, but not one of them could be interested in it—partly, perhaps, because Westinghouse was only a 21-year-old boy. Finally, after several attempts, he succeeded in getting an interview with Commodore Vanderbilt, who controlled a great amount of railroad stock. He started to explain his brake, but the Commodore cut him off with the question, "Do you mean to tell me that you propose to stop a train running at full speed with wind?" "Just so," replied Westinghouse. Vanderbilt turned to his male secretary and shouted, "Show this young lunatic out and never let

him trouble me again. I have no time to waste on fools who would stop trains with wind."

Ultimately, W. W. Wood of the Panhandle Railroad appreciated the possibilities of the device and provided a train for demonstration purposes—the expense of which Westinghouse and his helper Baggaley had to pay. That the brake would work was dramatically proved by stopping the train just in time to avoid striking a drayman who had been thrown in front of it.—From *Safety Education*, November, 1935.

HE COULDN'T COUPLE IT, COMMERCIALLY

An inventor by the name of Janney designed the car coupler—a new device with which the trainman could, by means of a crank, couple and uncouple cars without getting in the very dangerous position between them. But it took Janney ten years to sell his idea and get a foundry to make his device.

ACCOMMODATIONS FOR MEALS AND REST? HA! HA!

Benjamin Dearborn astonished Congress in 1819 by "contemplating" that "railroad carriages be furnished with accommodations for passengers to take their meals and their rest during passage as in a packet; that they be so capacious as to accommodate twenty, thirty, or more passengers, with their baggage. . . . That the carriages will move with a rapidity at least equal to a mile in three minutes."—W. H. BROWN, "History of First Locomotives in America," D. Appleton & Company, 1874.

TAKE OFF YOUR BOOTS, BOYS

In 1858, George Mortimer Pullman, a young contractor, built two "sleeping cars"—remodeled coaches

—for the Chicago and Alton. The brakemen made up the beds. Incidentally, the passengers, inexperienced in night travel on the train, were asked by posted notices to remove their boots before climbing into their berths. These cars proved so successful that Pullman decided to build a special “sleeping-coach.” He invested his entire savings, some \$20,000, in the idea, and by 1864 his famous “Pioneer” (later used to carry Lincoln’s body from Washington to Springfield) was completed.

However, when Pullman attempted to interest railroad companies in his “sleeping-coach,” he met much opposition. The \$2.00 fee, said railroad officials, was entirely too high and would discourage night riding. In order to prove his point, Pullman challenged them to a test, and his coach was coupled onto a night train which included several of the old-type remodeled “sleeping-cars.” The result was that the coach had more business than it could handle. So the “sleeping-car” disappeared.

A MENACE TO MORALS

When the sleeping-car began to appear as a part of the regular equipment of American railroads, more than one uplift and reform society denounced “a car in which men and women unmarried to each other sleep in the same room” as a “menace to morals.”

FLAGLER’S FOLLY

“Key West is completely isolated from the rest of the country,” thought Henry Flagler one day while riding a train down the coast of Florida. “It is not connected with the thousands of miles of American railways. Miami is the dead end of the railroad line.

Yet Key West is only sixty miles from Havana, and Cuba is developing fast. The completion of the Panama Canal will bring additional business. Steamship traffic is increasing by leaps and bounds, and most of these steamers stop at Key West. Why not build a railroad to the end of the coral reefs, run the cars onto large ferries, take them to Cuba, and run them off right onto the Cuban railway tracks? Key West is one of the most strategically important points in the whole country. I'll talk to my engineers about it."

He did, and found them skeptical. They pointed out the lack of suitable roads and road beds, the Everglades—which could not be drained, because they were lower than the Atlantic, the waves, the gales, the swamps, water and reefs; they pointed out the impossibility of the project, and, even admitting that it might be done, stressed the tremendous cost. The people of Miami were anxious to help promote anything that would develop their fair city, but this project was ridiculous. They called it "Flagler's Folly."

BUT—"Flagler's Folly" ultimately became a stupendous reality.

THE AUTOMOBILE

Those of us who have forty- or forty-five-year old memories can easily recall the early horseless carriages with their high, open, buggyish-looking bodies, their "tonneaus"—in case they were two-seaters, their square brass lamps, their whip-sockets (several of the first cars actually had these), their funny looking windshields, their prominent engine cranks, their exposed machinery underneath, and their noise and smoke, as well as the duster, goggles, and gloves worn

by the well-dressed driver.

Too, we can probably recall the yells of derision that greeted these "fool contraptions"—"get a horse"; "they're dangerous"; "No, sir, I'll stay out of them"; "they'll scare the horses, cause them to run away and kill folks"; "the manufacturers may sell a few, but not many"; and maybe, even, the old-time popular song—

"He had to get out,
Get out and get under,
To fix up his automobeel."

And we can remember the many scoffing and skeptical cartoons that appeared in our newspapers and magazines.

Perhaps, further, we can recall that the first cars were costly, and were owned only by the wealthy, and that "soak the rich" laws were passed against them in many localities; that speed limits were usually set at from four to eight miles an hour; and the "jackass laws," such as that which required an autoist meeting a horse-drawn vehicle to get out and lead the horse past the car. In order to make this unnecessary one inventor actually patented the "Horsey Horseless Carriage" which had a wooden horse stuck out in front to fool the real horses!

In short, many of us have had the unique experience of having seen a bit of foolishness develop into one of the most essential parts of our present-day lives—and all within the short space of three decades.

STONES, TRENCHES, TAXES, AND RED FLAGS

The immediate predecessor of the automobile was the steam buggy or the steam carriage of a century

ago. By 1833, twenty steam coaches were traveling in and around London, and a dozen companies had been formed to build and operate them on stage routes. . . . The noisy "steamers" were ridiculed. Boys threw stones at them; farmers dug trenches across the roads to impede their clumsy progress . . . and the English Parliament in 1836 passed the "Road Locomotive Act" which imposed so high a tax on steam vehicles that their owners could not operate them profitably. Worst of all, the law required that a man carrying a red flag should walk ahead of a steam coach to warn the people on the road! . . . (this law) killed the automobile in England, just when it was beginning to win its way. Vicious as it was, that act remained in force for sixty years, restraining English engineers, while Frenchmen, Germans, and Americans forged ahead.—WALDEMAR KAEMPFERT, "A Popular History of American Invention," vol. 1, pp. 136, 137, *Charles Scribner's Sons*, 1924.

In the early 1860's Parliament placed additional restrictions on horseless vehicles: they must have tires at least three inches wide; engines must consume their own smoke; they must have two drivers; they must not exceed 10 miles an hour in the country and 5 miles in the city.

And, as if these regulations were not restrictive enough, Parliament, in 1865, decreed that all horseless vehicles must have three drivers, one of whom shall precede the vehicle at least 60 yards, carrying a red flag by day and a red lantern by night. And this Act reduced the speed to four miles in the country and two in the city. These Acts were not repealed until 1896.—F. B. HUNT, "Self-Propelled Cars Sought 500 Years

Ago," *New York Times*, April 27, 1930.

NOT ON OCCUPIED PREMISES

During the first third of the nineteenth century several steam cars had been produced in Germany. They were unpopular with the people, and one ingenious "anti" dug up an old law which, in a Prussian court, established the illegality of some of these vehicles. This law prohibited "occupied premises" over a steam boiler. In several of these early cars the boiler was located under the driver's seat; in other words, "occupied premises" were over it. Consequently, the contraption was not according to law.

THE HORSELESS CARRIAGE CRANK

Selden, who is usually credited with the invention of the gasoline-propelled automobile, filed his application for a patent in 1879, but it was not until 16 years later that he was actually granted the patent. For years he strived vainly to interest capital for the exploitation of his idea. But he was scoffed at and derided as the "horseless carriage crank."

SUCH NAMES!

Both "automobile" and "motor car" were early suggested as names for the new vehicle, but for several years neither of these took hold. Manufacturers and the public alike did not favor "motorcar" because only electric cars had "motors"; the obviously accurate alternative, "enginecar" was not considered euphonious. "Automobile," it was thought, was too un-descriptive, and too "non-understandable," although, really, it was certainly as comprehensible as some of the names indicated below. Among the many names

seriously suggested and considered were the following:

auto buggy	bugmobile	kerosene car
auto carriage	cabine	locomotive
autofiacre	carleck	motocycle
auto gondola	engine car	petrocar
autokinet	gasbuggy	polycycle
autoso	gasmobile	road locomotive
autovehicle	go-along	selfpropellor
autovic	horseless carriage	sineque
buggycar	ipso motor	victorino

No SIR!

"In 1895, when I invited Samuel Bowles II, famous editor of the Springfield, Massachusetts, *Republican*, to ride in the Duryea with which I had won the first automobile race, his reply was, "I appreciate your kindness, but really, it would not be compatible with my position."—C. E. DURYEA, "It Doesn't Pay to Pioneer," *Saturday Evening Post*, May 16, 1931, p. 102.

DRIVER IS NOT AS SMART AS A HORSE

In 1896 A. R. Sennett read a paper before the British Association for the Advancement of Science in which, among other things, he stated: "Horseless carriages cannot be widely used because they require great skill, inasmuch as the driver has not the advantage of the intelligence of the horse in shaping its path."—L. H. ROBBINS, "Old Cry 'Get a Horse' Echoed in the Sky," *New York Times Magazine*, December 23, 1928.

FORD'S THREE FOOLISHNESSES

1. *Ford Wanted an Automobile.* Henry Ford, a \$45-a-month Detroit mechanic was called "crazy" by his

friends because, first, he was "neglecting everything else for the stupid dream of a horseless carriage," and second, because he was working with an unknown gas instead of the well-known steam.

BUT—after three years of "craziness," Henry Ford, in 1893, rolled his bicycle-wheeled, two-cylindered, 4-horse-power car out of the shed early one morning and drove it down to the end of the street and back.

2. *Ford Wanted an Inexpensive Car.* Ford foresaw the market for a low-priced car that almost anyone could buy. His salesmen did not like the idea; neither did his partners, and they voted it down.

BUT—Ford gained control of 51 per cent of the stock, went ahead with the revolutionary idea of mass production, and in 1909 the famous "Model T" appeared. By 1914, 500,000 of this model were on the road; by 1916, 1,000,000; and by 1918, 2,000,000. Shortly thereafter the annual production of "Fords" reached the amazing total of 2,000,000 cars.

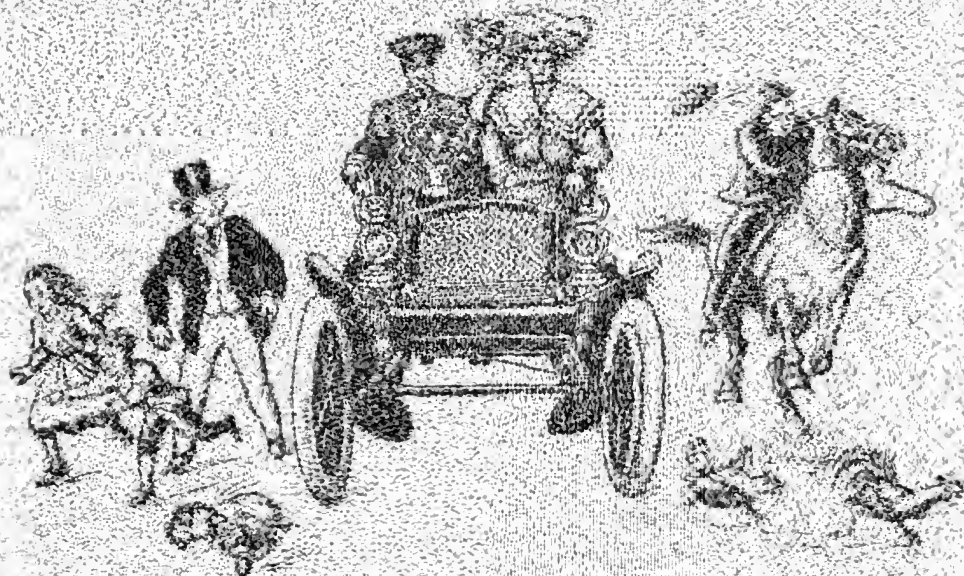
3. *Ford Wanted a Profit-sharing Plan.* On January 5, 1914, Ford announced that his company had established a \$5-a-day minimum wage scale—a profit-sharing plan with a previously estimated bonus paid regularly as a part of wages. This plan was immediately denounced as one that "would rob a workman of his initiative by paying him too much all at once;" as an "abominable trap;" and as a "brain-soul-and-life-purchasing type of commercial slavery." One of the country's greatest newspapers predicted "serious disturbances" from the policy which was so "distinctly Utopian and dead against all experience."

BUT—Ford had his profit-sharing plan, and it

worked. Further, it was widely copied.

GET IT OFF THE STREETS

Elwood Haynes, a machinist of Kokomo, Indiana, was another of the fools who was interested in making a carriage that would be driven by a small gasoline engine. Securing the aid of the Apperson brothers, who had a machine shop, he planned, built, experimented, tore down, replanned, rebuilt, and tore down until he finally had what he called the Haynes-Apperson automobile. In 1895 he was giving a demon-



That fool contraption—the horseless carriage.

stration of his vehicle on the streets of Chicago, when an unenthusiastic policeman stopped him and told him to get his "horseless carriage" off the street.

NO IMPROVEMENTS IN SIGHT

Andrew Carnegie bought a Winton car in 1905 and was so pleased with it that he wrote to Mr. Winton: "We are greatly pleased with our new Winton. . . ."

There may be improvements yet to come even in such autos, but it is difficult to see much room for them."

USED CAR SALE

By 1919 hundreds of thousands of automobiles were being produced annually in America—and being sold. However, in this same year said a famous statistical expert and business commentator: "The market for new automobiles has now reached the saturation point. Hereafter the market for automobiles will be limited almost entirely to used cars."

BUT—since that time new automobiles on the road have increased more than fifteen times. About 700 new cars are now built, throughout the world, every hour of the year.

NOTHING CAN BEAT THE HORSE

Chauncey M. Depew once confessed that he warned his nephew not to invest \$5,000 in Ford stock because "nothing has come along to beat the horse."—*Reader's Digest*, October, 1937.

AUTOMOBILITIS INIMICAL TO MORAL WELFARE

"Automobilitis" was declared, by clergymen without number, to be inimical to the moral welfare of the country. These reverends believed that the automobile would decrease their Sunday audiences and carry young folks away into all sorts of deviltry; apparently they did not believe that the vehicle would enable many persons to get in to Sunday services, or that it would carry many young persons to all sorts of wholesome affairs and events.

IF HE HAS ANY SENSE

W. C. Durant's prediction that some day 500,000

automobiles would be manufactured annually in the United States is said to have provoked George W. Perkins to declare, "If he has any sense, he'll keep those notions to himself, if he ever tries to borrow money."—"Technological Trends and National Policy," p. 44, National Resources Committee, Washington, D. C., June, 1937.

TRADE 5 FOR 200? NOPE!

J. P. Morgan & Company refused to buy for \$5,000,000 a block of securities which were later incorporated in General Motors and rose to a value of \$200,000,000.—T. F. MACMANUS and NORMAN BEASLEY, "Men, Money, and Motors," p. 117, Harper & Brothers, 1929.

THE FOOL WHO WANTS TO RIDE ON AIR

When I first came to Washington I learned at the Patent Office that officials had derided a man who had haunted their corridors. They called him "the fool who wants to ride on air," because he had an idea for a pneumatic tire.—MERLE THORPE, *These Men Make Our World, Scribner's Commentator*, September, 1937.

VI

WATER AND AIR TRANSPORTATION

THE STEAMBOAT

PAPER-SKULLED HULL

Sixty years before Robert Fulton's "Clermont" paddled out into the Hudson and up towards Albany, an Englishman, Johnathan Hull, built a crude steamboat. This vessel attempted its maiden voyage in 1736, and was not very successful. A newspaper poet of the time recorded the attempt in this verse:

Johnathan Hull,
With his paper skull,
Tried hard to make a machine
That would go against wind and tide;
But he, like an ass,
Couldn't bring it to pass,
So at last was ashamed to be seen.

—JAMES BURNLEY, "The Romance of Invention,"
p. 57, Cassell & Company, 1886.

FRANKLIN THOUGHT HE WAS HUNGRY

After having built and operated, rather unsuccessfully, four steam-driven "paddle-boats" on the Delaware River, John Fitch designed a screw-propelled boat which he demonstrated on Collect Pond in New York. It was more successful than his earlier boats. However, his appeal to the American Philosophical Society of Philadelphia for financial support was re-

jected—with scoffs.

Then Fitch went to see the great American inventor, Benjamin Franklin, who, after listening to his story, believed that the man was somewhat “off” because he was hungry and offered him money with which to buy food. Fitch angrily refused it. Fitch then went to France, where again he met with rebuff. After returning to America, where he was jeered at for his “madness,” Fitch finally retired to Bardstown, Kentucky, and some time later he committed suicide.

BUT—Fitch was the first man to apply the screw-propeller idea to steam boats—an idea which was patented some 40 years later by Francis Pettit Smith and John Ericsson.

BARRING ACCIDENTS, IT WOULD ALMOST STEM THE DELAWARE

In 1790, when John Fitch’s steamboat was making technically successful trips on the Delaware River, with its schedule of daily sailings advertised in the Philadelphia newspapers, Benjamin Franklin Bache, the philosopher’s grandson, ridiculed the boat as follows:

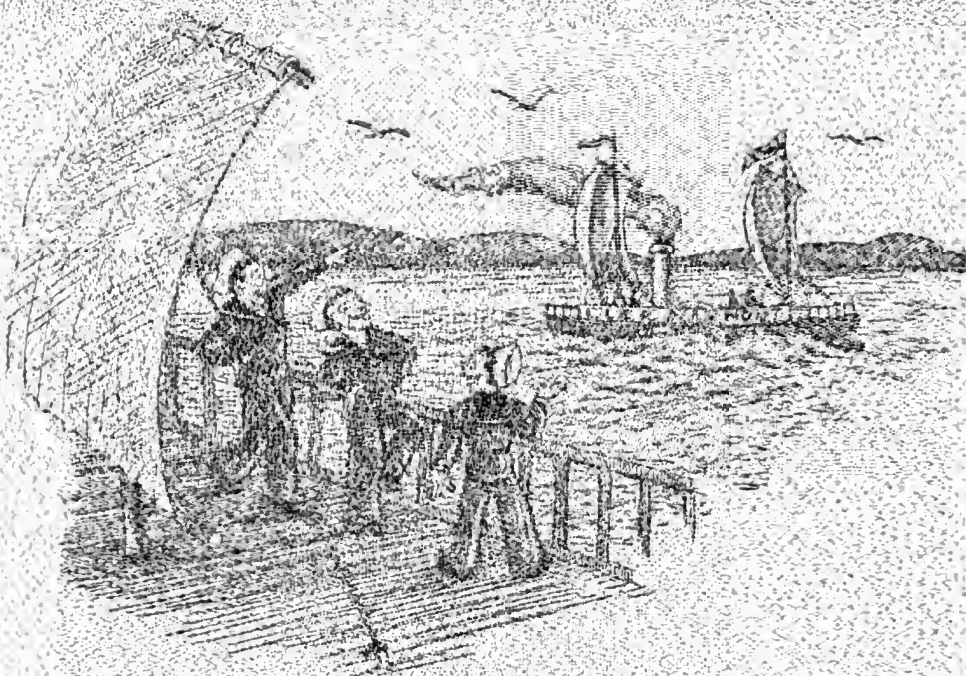
“A boat of this construction, barring all accidents of breaking paddles, cranks, gudgeons, watchwheels, chains, loggerheads, cocks, valves, condensers, pins, bolts, pistons, cylinders, boilers, and God only knows how many more useful parts, would almost stem the tide of the Delaware.”—THOMAS BOYD, “Poor John Fitch,” pp. 229, 230, G. P. Putnam’s Sons, New York, 1935.

THE LOUD LAUGH AT MY EXPENSE

The popular reaction to Robert Fulton’s idea of a

steamboat is probably best shown by the following letter which Fulton wrote to his friend, the eminent American lawyer, Judge Storye.

"When I was building my first steamboat at New York, the project was viewed by the public, either with indifference or contempt, as a visionary scheme. My friends, indeed, were civil, but they were shy. They listened with patience to my explanations, but



If that's a steam boat, why the sails?

with a settled cast of incredulity on their countenances. I felt the full force of the lamentation of the poet:

Truths would you teach, to save a sinking land;
All shun you, none aid you, and few understand.

"As I had occasion to pass daily to and from the building yard while my boat was in progress, I have often loitered, unknown, near the idle groups of

strangers gathered in little circles, and heard various inquiries as to the object of the new vehicle. The loud laugh often rose at my expense; the dry jest, the wise calculation of losses and expenditures; the dull but endless repetition of the Fulton Folly. Never did a single encouraging remark, a bright hope, or a warm wish cross my path. Silence itself was but politeness, veiling its doubts, or hiding its reproaches.

“At length the day arrived when the experiment was to be put into operation. To me it was a most trying and interesting occasion. I invited many friends to go on board to witness the first successful trip. Many of them did me the favour to attend, as a matter of personal respect; but it was manifest that they did it with reluctance, fearing to be partners of my mortification, and not of my triumph. . . .

“The moment arrived in which the word was to be given for the vessel to move. My friends were in groups on the deck. There was anxiety mixed with fear amongst them. They were silent, sad, and weary. I read in their looks nothing but disaster, and almost repented of my efforts.

“The signal was given, and the boat moved on a short distance, and then stopped and became immovable. To the silence of the preceding moment now succeeded murmurs of discontent, and agitations, and whispers, and shrugs. I could hear distinctly repeated: ‘I told you it would be so; it is a foolish scheme; I wish we were well out of it.’ I elevated myself on a platform and addressed the assembly. I stated that I knew not what was the matter, but if they would be quiet, and indulge me for half an hour, I would either go on, or abandon the voyage. This short

respite was conceded without objection. I went below, examined the machinery, and discovered that the cause was a slight maladjustment of some of the works. In a short period it was obviated.

"The boat was again put in motion. She continued to move on. All were still incredulous. None seemed willing to trust their senses. We left the fair city of New York; we passed through the romantic and ever-varying scenery of the highlands; we descried the clustering houses of Albany; we reached its shores; and then—even then, when all seemed achieved—I was the victim of disappointment. Imagination superseded the influence of fact. It was then doubted if it could be done again, or, if done, it was doubted if it could be made of any great value."—JAMES BURNLEY, "The Romance of Invention," pp. 227-229, Cassell & Company, 1886.

WILL THEE RISK THY LIFE?

An eye-witness and narrator of the events preceding and during the "Clermont's" first trip had, among other things, this to say: "The queer-looking craft excited much attention and no small amount of ridicule. . . . When it was announced in the New York papers that the boat would start from Cortlandt Street at six-and-a-half o'clock on Friday morning of the fourth of August, and take passengers to Albany, there was a broad smile on every face, and the inquiry was made—if anyone would be fool enough to go. One friend was heard to accost another in the street with—'John, will thee risk thy life in such a concern? I tell thee she is the most fearful wild fowl living, and thy father ought to restrain thee.' "

Further, this narrator had this to say about Fulton:

"He heeded not the fearfulness, doubts, or sarcasm of those by whom he was surrounded."

AN EARLY RACKET

After the success of the first New York-Albany trip of the *Clermont*, published ridicule subsided, but there appeared a more definitely harmful type of opposition, an early form of the modern "racket." Combining their efforts to drive the hateful steamboat from the Hudson, competitors resorted to all sorts of low-down tricks such as, for instance, pushing various kinds of obstacles—boats, logs, rafts, etc.—in her way with the hope that these would damage her paddle wheels; deliberately ramming her in order to cripple her; and bribing members of her crew to disable her engine and machinery.

NO NAMES, PLEASE

Those who loaned Robert Fulton money for his steamboat project stipulated that their names be withheld, for fear of ridicule and loss of status, were it known that they supported so "foolhardy" a project.—"Technological Trends and National Policy," p. 46, National Resources Committee, Washington, D. C., June, 1937.

A NIGHTMARE DREAM

In 1803, four years before the first trip of the *Clermont* in America, Robert Fulton was successful in operating a steamboat on the Seine River at Paris. The great Victor Hugo often watched it and once described it as "a thing which smoked and clacked on the Seine, making the noise of a swimming dog; it went and came from the Tuileries to the Point Louis Quinze

—a machine good for very little—a nightmare dream from Utopia to a steamboat.”

PERFECTLY RIDICULOUS

After the river steamboat had ceased to be foolishness, there was, naturally enough, talk about the possibilities of steamship service across the Atlantic Ocean. But this possibility brought hoots, from even educated and supposedly intelligent people. For instance, Dr. Lardner, one of the best educated men of his day, had this to say about the projected trans-Atlantic steamship line: “As for the talk in the newspapers of a direct steamship line between Liverpool and New York, this is perfectly ridiculous. You might as well talk about a direct steamship line between Liverpool and the moon.”

THEY CONSIDERED ME AN IDLE DREAMER

John Ericsson left England and came to America, and became a naturalized citizen in 1848, after having unsuccessfully tried to interest English shippers and shipbuilders in his screw propeller. The attitude of these American shippers and shipbuilders was the same as that of the British and is described by Ericsson himself as follows: “Incredulously and pityingly they looked upon me. . . . They even considered me an idle dreamer.”

IRON SHIPS? THE VERY IDEA!

When first suggested, and even later when plans were drawn for iron ships, sea-wise sailors as well as officials of steamship companies scoffed, using as their main arguments: (1) iron ships would not float; (2) they would damage more easily than wooden

ships when grounding; (3) it would be very difficult to preserve the iron bottoms from rust; and (4) the iron hulls would deflect the compass.

WOULD BE SMASHED FLAT LIKE A PANCAKE

A few years ago a high-up German naval architect stated: "I am familiar with the ideas of the Americans, Holland and Lake, and have studied the submarine problem very carefully and for a long time, but I am convinced that no such vessel could exist in the water because, in the first place, it would collapse when it went down under the water, and, in the second, its crew would be smashed flat as a pancake."

WILL ONLY SUFFOCATE ITS CREW AND FOUNDER

H. G. Wells joined the popular ridicule of the submarine by writing ("Anticipations," p. 217, 1902), "I must confess that my imagination in spite of spurring refuses to see a submarine doing anything but suffocating its crew and foundering at sea."

AIR TRANSPORTATION

Probably man's methods of transportation came somewhat in this order: he learned to ride a floating log, and later developed water-craft; then he learned to ride animals, and later to harness them to crude sledges, and still later, to wheeled vehicles. And, turning to the air, undoubtedly he early contemplated the possibilities of imitating the birds. His yearning to fly and his ideas of the possibilities of human flight are reflected in many ancient legends, such as, for instance, Daedalus and Icarus, the Greeks; Ayar Katsi, the flying man of the Peruvians; the mythical German smith, Wiedland, who fashioned feather clothes; the

flying carpet of the Arabian Nights; the seven league boots; the flying gods of antiquity and the angels of Christianity; from these on down to our own well-known "Darius Green and His Flying Machine."

However, air transportation, presenting many more practical difficulties than either water or land transportation, developed much later than these. In fact, flying presented so many practical problems that, for years and years, man has expressed his evaluation of some more or less obvious impossibility with a contemptuous, "Might as well try to fly." Well, let's see.

EVEN SHAKESPEARE SCOFFED

Ovid's classic about those early aeronauts, Daedalus and Icarus, is well known, but probably not so well known is the reaction taken towards this first flight by the great Shakespeare. A brief outline of the story will set the stage for the poetic ridicule of this distinguished man of letters.

Daedalus was an artificer and sculptor of Athens and Crete. Incurring the wrath of Minos, king of Crete, he and his son Icarus were imprisoned. In order to escape, Daedalus and his son each made a pair of wings out of wax and feathers. Together they started to fly across the Aegean Sea, and all went well until Icarus flew so high that the sun melted the wax, the feathers fell out, and the unfortunate Icarus tumbled into the sea and was drowned. Daedalus, so the legend runs, did not fly so high and escaped.

Shakespeare derided these legendary "fools" in these words:

"Why, what a peevish fool was that of Crete,
Who taught his son the office of a fowl;
And yet for all his wings the fool was drowned."

ANOTHER FOOLISH PROPHECY

A time will come when thou shalt spy
A vast armada battling on high
In long invasion; while the old folk gaze
Astounded and in silence, from afar
Watching the flying feet of unknown birds.
—From "Luna Habitabilis," Thomas Gray, 1737.

KILL THE FRIGHTFUL CREATURE

Prof. J. A. C. Charles, an early balloonist, had been experimenting with hydrogen gas, and finally



obtained enough to inflate a balloon. After considerable difficulty in getting a fabric light enough to float and tight enough to retain the gas (he painted it with a solution of rubber), Charles made a trial balloon. This passengerless balloon was flown on August 27, 1783. It ascended and drifted out of sight. Later it landed near some ignorant peasants who became convinced that it was some frightful creature.

Kill it! Kill it! Kill it!
The more courageous of them attacked it with

pitchforks, the others pitched in, and soon the hapless gasbag was reduced to a complete ruin.—ARCHIBALD BLACK, "The Story of Flying," p. 13, McGraw-Hill Book Company, Inc., 1940.

MOB HIM

Probably the greatest of all early aeronauts was Jean Blanchard, a Frenchman, the first man ever to fly across the English Channel. Upon hearing of his exploit, Benjamin Franklin invited him to come to the United States and demonstrate his device. He did, and so became the first man ever to make an ascent into the air in this country. This first flight took place at Philadelphia on January 9, 1793, in the presence of George Washington and a number of other distinguished Americans. Blanchard landed in a field in New Jersey, about 15 miles from his starting point, where he was almost mobbed by the startled inhabitants who had never seen a balloon and could not understand the Frenchman's attempts to explain the situation. Finally, he was able to escape when he showed a passport bearing the magic signature of George Washington.

HE WENT SUCCESSFULLY NOWHERE

In 1785 the Irish Lord-Lieutenant knighted one Richard Maguire, a balloonist, for "successfully going nowhere, and safely coming back."

SIR ISAAC NEWTON PROVED IT IMPOSSIBLE

Sir Isaac Newton, the distinguished English philosopher, knew about the classic story of Daedalus and Icarus, and the flying theories of Roger Bacon and Leonardo da Vinci, but when asked about the probabili-

ty of man ever actually flying, he stated that mechanical flight was an impossibility—and he went further and proved it with mathematical computations.

THE SAME STORY IN 1906

Scientist Simon Newcomb wrote in 1906, just as success of the airplane was in the offing, "The demonstration that no combination of known substances, known forms of machinery, and known forms of force can be united in a practicable manner by which men shall fly seems to the writer to be as complete as it is possible for the demonstration of any physical fact to be."—SIMON NEWCOMB, "Sidelights on Astronomy," p. 345, Harper and Brothers, 1906.

LANGLEY'S FOLLY

Dr. Samuel P. Langley, secretary of the Smithsonian Institution, after listening, in 1886, to a paper on toy airplanes read at the Buffalo meeting of the American Society for the Advancement of Science, became interested, and built several rubber-band and steam-driven models, thereby proving to his own satisfaction that mechanical flight was possible.

President McKinley, at the request of Theodore Roosevelt, Assistant Secretary of War, appointed an Army-Navy Board to investigate, and, when its report was favorable, secured an appropriation of \$50,000 with which to build a man-carrying airplane.

Five years later, on October 7, 1903, Langley's "aerodrome"—powered by a remarkable radial five-cylinder, water-cooled engine developed by Charles M. Manley—was launched from the top of a houseboat in the Potomac River. However, the launching apparatus failed, and the "aerodrome" slid off into the river, al-

most drowning Manley, the pilot. It was repaired; another attempt was made on December 8, but this too ended in failure, apparently because the tail fouled the launching gear just as the plane left the runway.

Immediately there was an avalanche of ridicule and abuse from all parts of the country, and in the face of this the War Department withdrew its support. Three years later Langley died of a broken heart. Incidentally, the remains of the "aerodrome" were kept out of sight in the Smithsonian Institution and were not exhibited for some time after Langley's death.

BUT—on May 28, 1914 this same airplane, with some modifications and equipped with floats, was flown with the original engine by Glenn Curtiss at Hammondsport, New York. In 1918, after having been restored to its original form, it became a permanent exhibit at the Smithsonian Institution, where it may be seen today.

NOT AT ALL PROBABLE

I do not think it at all probable that aeronautics will ever come into play as a serious modification of transport and communication.—H. G. WELLS, "Anticipations," p. 35, London, 1902.

BUT—Less than 40 years later air lines spanned every continent and several oceans. Some \$500,000,000 was spent in a single year in the United States for aircraft. Before World War II at La Guardia Field, New York, there were 238 scheduled arrivals and departures each 24 hours, more on holidays and weekends. During the year 1941, sixteen operating companies in America, using some 365 planes, flew more than 126,000,000 miles, and carried nearly 3,500,000 passengers.

THE WRIGHT, OR WRONG, BROTHERS?

Wilbur and Orville Wright were the proprietors of a bicycle shop in Dayton, Ohio. Mechanically minded and interested in flying airplane models and kites, these brothers ultimately, under the inspiration of such aviation pioneers as Lilienthal, Chanute, Maxim and others, took up gliding. For more than two years these brothers built and flew man-carrying gliders—devising controls and learning to manipulate them. Finally, at Kitty Hawk, North Carolina, on December 17, 1903, just nine days after the second failure of Langley's "aerodrome," in the presence of four men and a boy, Orville Wright made a flight of 12 seconds, covering a distance of about 120 feet. Three additional flights were made on that day, the fourth lasting almost a minute and covering a distance of 852 feet. Man, at last, had flown!

BUT—The Wrights had filed their application for a United States patent on March 23, 1903, while the airplane was still under construction. In due course of time their attorney found in his mail a formal notice of the decision of the patent examiners rejecting the application as covering a device that was "in-operative," a decision vividly illustrating the esteem in which "flying machines" were held by the United States Patent Office in the year 1903!—From ARCHIBALD BLACK, "The Story of Flying," chapter VI, McGraw-Hill Book Company, Inc., 1940.

A Cincinnati newspaper official refused to pay the toll on a telegram announcing the Wright brothers' first flight; and another editor paid it under protest and wired his reporter, "If you want to send me wild cock-and-bull stories about a man flying, you'll pay

for the telegrams yourself."

Unable to get deserved recognition in this country, the Wright Brothers took their plane to France and England, where they were more cordially received.

More than two years after the Wright's first flight, the *Scientific American* published a story of Wilbur's flights in France, under the title, "Wright Aeroplane and Its Fabled Performance."

At about the same time, a German aeronautical journal also carried reports of these flights under the heading, "An Americanisher 'Bluff'!"

PASSED UP A GOOD BET

Even the greatest money makers have been known to pass up good bets. Charles M. Schwab refused to back the Wright Brothers because he thought aviation was a crazy idea.—*Scribner's Commentator*, October, 1937.

INDULGE ACROSS THE WALNUTS AND WINE

A 1904 editorial in *The New York Times* saw "no possible objection" if those interested in flying cared "to indulge in airy persiflage across the walnuts and wine," but averred that "they should not expect those who have not dined with them to take them quite seriously."—From an editorial in *The New York Times*, March 30, 1931.

HE WOULD HAVE PUT WINGS ON THEM

One of the first aviation meets in this country was held on the lake front in Chicago in 1911. During the course of events on the second day, two of the aviators were killed. One was crushed by his motor when the plane collapsed at low altitude, and the other was drowned in Lake Michigan, into which he plunged

when his motor failed.

That evening the bishop of a well-known religious denomination came out with this statement, "These two needless deaths represent a sign of God's displeasure. If God had wanted humans to fly in His heavens, He would have put wings on them."

The present writer, then a college sophomore and somewhat of an aviation enthusiast, but lacking, of course, the bishop's experience and wisdom, replied in this fashion:

"According to your kind of logic, God doesn't want humans to ride in railroad trains or in automobiles, or we would have been born with wheels instead of feet. God doesn't want humans to swim or they would have been born with fins and a tail; further, God doesn't want humans to wear clothes or they would have been born with distensible overcoats instead of the usual birthday suits."

Needless to state, his letter went unanswered by the clergyman, although it did, when published, bring some abusive as well as commendatory communications from others.

AN UNIMPORTANT PATENT OFFICE CLASSIFICATION

Previous to April, 1926, when it established a separate class for aircraft, the German Patent Office had the same classification for airplanes as for children's toys, popular amusements, and shooting galleries.—"Technological Trends and National Policy," p. 47, National Resources Committee, Washington, D. C., June, 1937.

GUS, "THE FLYING FOOL," MADE IT!

Two decades ago men laughed at the idea of going

to Europe by airplane. And when, some sixteen years ago, Friday, May 20, 1927, Charles A. Lindbergh—"Gus Lindbergh the flying fool"—staggered off the ground with his little over-loaded 225-horse-power-monoplane and headed out across the Atlantic, they shook their heads and said, "He'll never make it." And when, 33 hours and 39 minutes later it was reported that Gus had landed at Le Bourget field, Paris, they called it a "circus stunt, proving nothing."

BUT—today great 6,000 horse-power, 41-ton Clippers, as large as one of Columbus' ships, and Flying Fortresses carrying tons of weight, are spanning the oceans of the world—and airplanes that will dwarf these are already in the making.

TOO MUCH TO REMEMBER

When the idea of retractable wheels for airplanes was first seriously suggested, some of the older flyers actually objected because "it would be too much for a pilot to remember." Today's airplanes are at least five times as complicated as those of yesteryear.—*Collier's*, June, 1942, p. 41.

IT DOES EVERYTHING BUT FLY

Some dozen years ago, Ed Link, a New York barn-stormer, had a "crazy idea" that he could build a device by means of which a person could be taught much of flying technique—on the ground! Such a machine, said he, would provide closely supervised, direct, and non-dangerous instruction; shorten actual flying time, and cut the cost of learning to fly. He built it—the "Link Trainer"—and demonstrated it first in the spring of 1928.

This ingenious device does everything that an airplane does, except fly, and the student pilot has all the sensations of flying, except motion. The trainer accurately mimics actual flying; it takes off, climbs, banks, slips, stalls, loops, rolls, spins, glides, and lands, and it even mimics the actions of an airplane with ice-encrusted wings, or one in rough air.

But it didn't take hold. Aviation schools sneered at the idea of "teaching a student to fly in the hangar," and by 1932 Link had sold only a few of these Trainers. The factory was kept going by the "admission fees" (twenty-five cents) paid by the yokels for short "flights" at fairs and carnivals.

BUT—Ed Link persisted in spite of detractors and scoffers, and today his Trainer, (now manufactured in two plants—at Binghamton, New York, and Guna-noque, Canada) is widely used in the United States, England, Germany, Russia, Italy, Japan, and other countries in instructing both commercial and military pilots.

FOR HEAVEN'S SAKE CALL HIM OFF!

He wanted to fly, so in 1909, at the age of 23, he rented an abandoned church, built an airplane out of bamboo sticks, cloth, wire, and odds and ends, and soon became one of the best known of early American flyers. However, the family doctor—unimpressed to say the least—wrote to a mutual friend as follows:

"For Heaven's sake, if you have any influence with that Wiled-Eyed Hallucinated, Vissionary young man, call him off before he is killed. Have him devote his energies to Substantial, feasable and proffitable

persuits, leaving Dreaming to Professional Dreamers."

TODAY, that "Wiled-Eyed, Hallucinated, Vissionary young man," Glenn L. Martin, is one of the world's greatest airplane manufacturers.—From *Look*, February 9, 1943, p. 48.

VII

AGRICULTURE

HE WASN'T QUITE RIGHT IN THE HEAD

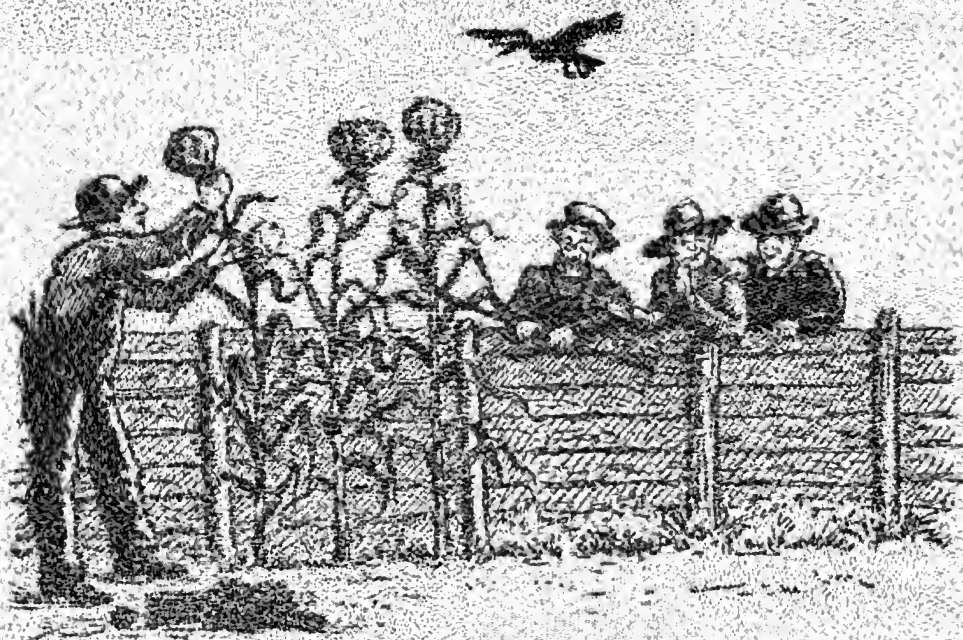
For 10 years, up until 1935, Lester Pfister's neighbors in El Paso, Illinois, were convinced that he wasn't quite right in the head. They couldn't understand why any sane individual would spend hours in a field under the boiling sun, tying paper bags on corn tassels. His arrival in town became a signal for snorts and laughter. When his farm went to ruin because he couldn't give it the time it required, fatherly old men used to stop Pfister on the road and beg him to quit his foolishness.

Pfister wanted a better corn, one with a shorter, straighter stalk of more uniform height, so as to be easier to pick; a corn that would root deeper, so that it would be more resistant to unfavorable weather, and not blow over so easily; he wanted longer, better filled out ears, with all grains matured. So, instead of allowing his corn to be "open-pollinated," as had always been the practice, he experimented with "cross-pollination"—inbreeding. He bred corn like the stockman breeds cattle, the kennel enthusiast breeds dogs, and the horseman breeds race horses. He pollinated the corn by hand, making 50,000 pollinations, covering the tassels with paper bags—100,000 of which he used during his experiment.

AND—after standing years of ridicule, staving off the mortgages on his farm, and going about half ragged and half starved, Pfister drove his "crazy"

experiment to a successful conclusion and produced "hybrid" corn—a corn that had all of the qualities for which he worked.

In 1935, while his neighbors were averaging \$2000 for the season's work, Pfister took in \$35,000—payment for the corn seed that he had developed. The following year he sold for \$10 a bushel every kernel he could raise, and took in \$150,000. He had a corn that



Maybe he's gittin' ready fer Hallowe'en.

would outyield anything ever grown in Woodford County by anywhere from six to 35 bushels. Orders rolled in from every state in the Corn Belt, and in 1937 he grossed \$400,000. This year (1938) advance orders backed by deposits point to a take of half a million.

Hybrid corn is now planted on more than 2,000,000 acres in the corn-producing states.

This year he will put into the farmers' pockets

\$100,000,000 that otherwise would not have been there.—GEORGE KENT, A Farmer Bags a Million Dollars, *The Country Home Magazine*, August, 1938.

A BASE AND CORRUPTING MODE OF FORCING NATURE

Amos Bronson Alcott, the American educationalist and writer—sometimes called the “American Pestalozzi,” and father of Louisa May Alcott of “Little Women” fame—was raised of farmer stock and all his life retained his interest in agriculture. But he would not allow manure to be spread on his land because he considered it “a base and corrupting mode of forcing nature.”—GILBERT SELDES, “The Stammering Century,” p. 208, John Day Company, 1928.

SELF-SERVING SODA FOUNTAIN FOR STEERS

A few years ago, A. I. Kaplan, importer of Cuban molasses for industrial purposes, faced with the loss of markets due to the development of a new method of distilling alcohol, became interested in the possibilities of molasses as stock food. He read up on the subject, and discovered that molasses had long been used in certain European countries for this purpose.

Kaplan designed automatic feeders—which he offered free to any rancher who would feed 100 head—and planned tank routes. However, he could not interest the scoffing ranchers, who called his idea “dude stuff,” and his feeder “a self-serving soda fountain for steers.” Even offers of free demonstrations failed. At last, Kaplan bought a herd, fed it in the former owner’s pens . . . and finally sold it back to the original owner who, convinced, began to buy molasses by the truckload.

AND—within two years, more than 2,000,000 range

cattle were being fed molasses—both in chopped-up fodder and “straight.” And Kaplan had contracted for all the molasses that Mexico could produce, as well as the surpluses from Cuba and Puerto Rico.—From UPTON CLOSE, *Molasses Rides the Range*, *Future*, September, 1940.

FARMERS WOULD HAVE TOO MUCH LEISURE TIME

Small town bankers and businessmen refused for many years to lend money on tractors, on the ground that they were a menace to farmers. These men agreed not only that farmers could not operate the machines profitably, but also that if they were successful, the farmer would have too much leisure time. They had invested in horses and foresaw the eventual decline in price of horses if tractors were utilized. The national horse breeders' associations led in circulating propaganda against tractors and were joined by the local bankers. Farmers were easily susceptible to such a campaign, for the price of tractors was high, horse-drawn implements became almost a total loss, and the farmers were often sentimentally attached to their horses. Farmers rarely had sufficient evidence one way or the other on the question whether the breakage on the tractor and the amount of fuel required were excessive. The opposition of the farm wage workers displaced by the tractor was also great.—BERNARD J. STERN, “Technological Trends and National Policy,” pp. 57, 58, *The National Resources Committee*, Washington, D. C., June, 1937.

IT WILL POISON THE GROUND

Up until the 19th century, the plow the American farmer used was little better than that used by the

ancient Egyptians. Usually it was merely a crooked branch of a tree, with sometimes an iron share to cut the soil, and less frequently a mouldboard for turning over the cut. Such a plow was very heavy and unscientifically made. The share usually cut at the wrong angle, and the mouldboard was so ineffective that the slice often stuck onto it or fell back into the furrow. Such plowing required two men and usually more than one team.

In 1797 Charles Newbold obtained a patent for a cast iron "plough" in which the share and the mouldboard were one piece, cast together. It did both the cutting and the turning jobs in fine shape, but farmers refused to buy it because they thought that the iron would poison the ground. Some of them contended that the iron would cause the weeds to grow faster. After devoting most of his life to the unsuccessful promotion of his invention, Newbold died believing "my life has been wasted."

FARMERS SCOFFED AT JEFFERSON'S CONTRAPTION

In 1798 Thomas Jefferson experimented with the idea of an improved mouldboard and designed, scientifically, the principle of an efficient mouldboard curve. But his "contraption" was scoffed at by farmers and manufacturers refused to accept it.

REPEAT PERFORMANCES

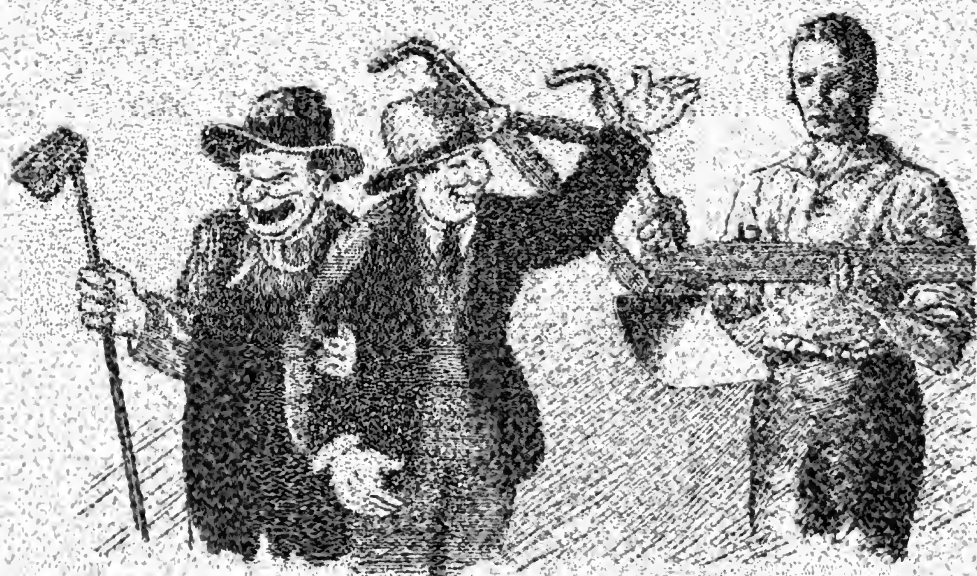
The attitudes taken by farmers towards Newbold's cast iron plough and Jefferson's scientifically designed mouldboard were in evidence again when Wood produced his separately-cast share and mouldboard; when John Lane manufactured his steel mouldboard; when

John Deere designed a much lighter plow; and when James Oliver introduced his chilled steel plow.

THESE HATED ENGINES

The following doleful story concerns the imagined damage that the introduction of a threshing machine would do in England in the year 1830.

"Threshing was one of the few kinds of work left that provided the laborer with a means of existence above the starvation level. . . . It is easy to imagine what the sight of one of these hated engines meant to a parish; the 15 men, their wives and families would



We're not interested, brother.

have found cold comfort, when they became submerged in the morass of parish relief, in the reflection that the new machine extracted for their masters' and the public benefit 10 per cent more corn than they could hammer out by their free hands."—J. L. and BARBARA HAMMOND, "The Village Labourer, 1760-

1832," pp. 82, 83, London, 1911.

SOLD ONLY A HUNDRED IN TEN YEARS

Prejudiced reasoning, traditions, and general inertia were as strong as ever when McCormick made his first successful reaper for grain. It was ten years before he sold the first one hundred machines.

THE FARMER'S ENEMY

The writer's father, an early Illinois farmer and bee-keeper, knew that honey bees could gather nectar from the sweet clover that grew in odd places about the countryside. After getting reports on sweet clover from farmers in other communities who used it both for purposes of fertilization and as animal food, he urged the local farmers to sow it. However, his friends, who considered it a noxious weed refused and made all sorts of attempts to eradicate it, even to digging out its very long roots.

Unable to convince the farmers of its value, this sweet clover promoter bought seed and sowed it not only on his own farm, but also up and down the country roadsides. His friends turned against him, especially when, after a year or two, the "noxious weeds" had begun to get into their fence rows and into their pastures. They labelled him "The Farmer's Enemy."

However, later, when they saw how the "Enemy's" animals prospered, and how the new crop enriched his soil, a few of the more adventurous of them sowed a little of the seed and later put up the crop of sweet clover hay. They found to their surprise that it cured well and that their animals liked it.

SO—within a few years sweet clover became a valuable crop; it was good for the ground, it was good

for the animals, and it was good for the bees. And the promoter's title was changed from "The Farmer's Enemy" to "The Farmer's Friend."

THE SOYBEAN FOOL

Up until about two decades ago the soybean was practically unknown to American agriculturists. The few farmers who raised soybeans produced only enough for their own feeding and fertilizing purposes. The soybean products—oil, meal, and cakes—were imported.

Eugene Staley, a Decatur, Illinois, starch manufacturer was, naturally enough, interested in greater and better corn crops. He knew the fertilizing value of soybeans and urged the local farmers to raise them in order to improve their corn yields. While campaigning for soybeans as a fertilizing agent, a second thought struck him—"We import soybean products; why can't we make them here?" Then he began a really enthusiastic campaign for the new crop. However, the farmers were unimpressed; some laughed, some ridiculed, and nearly all of them argued that there was no market.

Staley persisted in spite of discouragements and "talked and wrote soybeans, and wrote and talked soybeans" and, finally, to show his sincerity built a processing plant (1921) and offered to buy all of the beans the local farmers would bring in. The farmers were still skeptical, but this local guaranteed market carried weight, and some of them increased their acreage, while others who had never planted beans put in experimental crops. The result was that in 1922 Staley doubled his 1921 purchases. He was more enthusiastic than ever; his campaign never slackened,

and two years later ten times as many soybeans were raised in Illinois as were produced three years before.

AND—Now the annual soybean crop in America is well over 100,000,000 bushels, and Decatur—with its four mills—has become the “Soybean Capital of the World.” So, thanks to a far-sighted agricultural “fool”—and to far-sighted scientific “fools” who utilize it in an amazing array of industrial products—the soybean, an unknown twenty years ago, has become one of the nation’s most important plants.

DIDN’T SQUEAK LIKE THE OLD ONES

Dean Davenport tells a story about a new and valuable cart that was allowed to stand idle and eventually rot on a certain South American estate for the simple reason that the native laborers refused to use it. Why? Because it did not squeak like their native wooden carts!

VIII

MEDICINE

GALEN WAS WRONG

Miguel Serveto, or Servetus, disagreed with the teachings of Galen (a famous physician of antiquity whose theories were established by church dogma) in the matters of the circulation of the blood and the function of the lungs. Convinced that both the religious and the scientific views were erroneous and that the blood did not pass through the partition in the heart but from the right side to the left side by way of the lungs, Servetus published his discovery in his book, "Christianisimi Restitutio"—and was promptly attacked vigorously by both Protestants and Catholics. He and his book were burned in effigy at Lyons. He escaped to Naples, where he was "exposed" by Calvin and brought back to Geneva. Here he was tortured and burned at the stake in 1553.

THE ARTERIES CARRY AIR

From ancient times came the theory that the arteries carry air, and this is exactly what the word "artery" means—"air tube" or "air carrier." William Harvey, highly respected court physician to James I, to Charles I, and to the boy who later became Charles II, after a great deal of dissection and experimentation, dared to explain his (our modern) theory of circulation—the functions of the arteries, veins, and lungs. His colleagues denounced him bitterly as a "crack-brained fool" for opposing Galen, and he was all but

ostracized by his associates and friends. He lost his official position and most of his practice.

THE TRIALS OF THE FIRST MODERN DOCTOR

Paracelsus, often called the first modern doctor, was a bitter critic of contemporaneous medical practice, most of which was based on superstitions, clerical dogmas, and the accepted but unchecked theory of the "four humours,"—the planets, colors, numbers, etc. The physician knew little or nothing about anatomy or physiology; he "disdained to even touch the wounded man"; he would point with his cane, and the surgeon—the barber—would do the operating. Paracelsus, disgusted with all this, spent considerable time in travel, broadening his knowledge and experience.

Ultimately he returned to Basel and became town physician and lecturer on medicine at the university. He lectured in German instead of Latin, and this shocked both his academic and professional friends. He was considered an infidel and could not get his books published until by good fortune he saved the leg of a wealthy printer, who thereupon began to do his publications. Here again he was unprofessional; he published in the vernacular instead of in Latin. His students laughed at and ridiculed him, even lampooning him with an insulting poster placed on the door of his lecture room. He went to the city council for protection against his own students, but he was virtually forced from the university and began a series of aimless wanderings. He died in 1541, killed, it is said, by thugs commissioned by jealous physicians and apothecaries. He was buried in the churchyard of St. Sebastian, where two hundred years later a monument was

erected to his memory.

THE RESTRICTIONS WERE TOO SEVERE

The most distinguished teacher of anatomy at the University of Bologna during the fourteenth century was Mondino. Students from all over Europe came to his classes. Recognizing his ability, the Church made an unusual concession and allowed him to have two human bodies a year for his dissectional instruction. However, it made no concession in this—he was warned not to discover anything that would conflict with the teachings of Galen. A further restriction was that no books requested by him were to be added to the library until they had been officially approved by a committee of churchmen. In the face of these heavy handicaps, Mondino attempted to carry on his scientific work but, finding it impossible to do so, left the university and went to Naples.

HE WAS GUILLOTINED

Antoine Laurent Lavoisier was a French chemist who made a number of important contributions, probably the best known of which was his work with oxygen. He overthrew the phlogistic theory, which had delayed the development of chemistry for over a century. According to this theory, every combustible substance is a compound of phlogiston, and the phenomena of combustion are due to the phlogiston's leaving the other constituents behind. Combustion, said Lavoisier, is due to a chemical union of oxygen with the substance burned. He held that the function of the lungs was not to cool the blood, as Galen had thought, but to put oxygen into the blood and to throw off the carbon dioxide. Oxygen when taken into the blood

changes its color to bright red. He demonstrated that four-fifths of the volume of air is nitrogen and one-fifth oxygen.

His theories were ridiculed, even by so great a scientist as Priestly.

Outside of the strictly scientific field, Lavoisier demonstrated the advantages of "modernized" agriculture; planned, as a member of the provincial assembly of Orleans, the improvement of social and economic conditions of the community by means of savings banks, insurance societies, canals, and work-

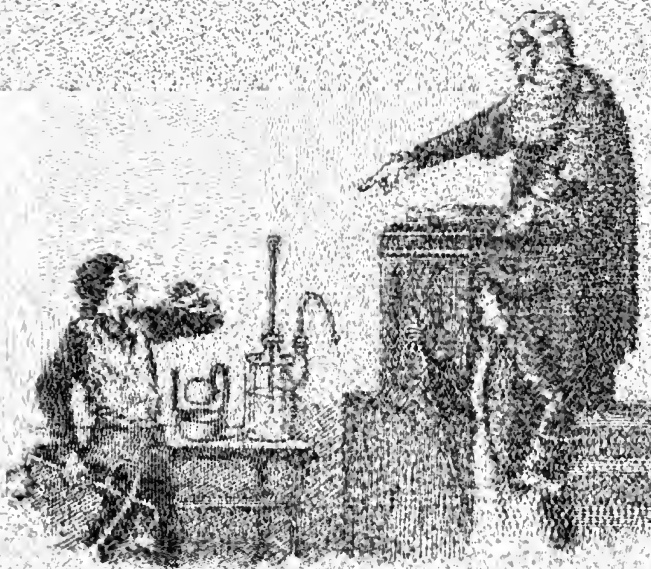
houses; devised a new scheme of taxation, uniformity of measures and weights, and was associated with committees on hygiene, coinage, and other vital matters.

Marat accused him of putting Paris in prison and stopping the

The guillotine for you!
circulation of air by the "mur d'octroi" erected at his suggestion in 1787. He was arrested, tried by a Revolutionary tribunal, and on May 8th, 1794, he was guillotined.

THE REPUBLIC HAS NO NEED OF CHEMISTS

There hangs in my office a picture entitled "The



Arrest of Lavoisier." The great chemist, one of the greatest men ever produced by France, had been the first to explain combustion in the terms we now accept. During the French Revolution, Marat denounced Lavoisier as "the master of charlatans." In my picture Lavoisier stands in silent dignity as he listens to the reading of the warrant by an arrogant fellow in a red cap, behind whom crowd the exulting rabble. The arrest was followed by the inevitable sentence of death from a judge who, in passing it, declared, "The Republic has no need of chemists."—Adapted from ARTHUR D. LITTLE, "New Lamps for Old," *The Technology Review*, October, 1931, Massachusetts Institute of Technology.

TOO AMAZING TO BE TRUE

In 1796, during a cowpox plague in Gloucestershire, Dr. Edward Jenner inoculated a small boy with pus from a sore on one of the victims. He found that the sore healed and the boy did not take the disease. Some time later he again inoculated the boy, this time with pus from a victim of smallpox. And here, again, he found that the boy did not contract smallpox. He continued his experiments and came to the conclusion that cowpox protected against smallpox. In 1798 Dr. Jenner wrote up the story of his experiments and sent it to the "Transactions" of the Royal Society—only to have it returned to him. "The observation," the Society reported, "was too amazing to be true. . . . It was only by mere chance that the boy did not take the smallpox." Jenner then published the account himself under the title, "Inquiry Into the Cause and Effect of Variolae Vaccine."

Violent opposition flared up immediately, not only

by the clergy but by the medical profession itself—led by a most distinguished surgeon, J. Ingenhouse. Some of the opponents even argued that persons who were vaccinated would probably take on the characteristics of the animal from which the vaccine was taken.

As is often the case, the prophet was accepted more readily in foreign countries than in his own. The Dowager of Russia sent him a ring and gave the name Vaccinoff to the first child vaccinated in Russia. Napoleon had all the men of his great army vaccinated, and the American Indians expressed their appreciation by sending a deputation to thank him personally and bring him gifts.

Finally, Oxford conferred on him an honorary degree. The College of Physicians wanted him as a member, but set an examination in the classics as a part of the requirements. The humble doctor refused to take the examination and so was not elected to this august body.

INOCULATION FORBIDDEN

In 1721 Cotton Mather read in the "Transactions" of the Royal Society of London an account of inoculation against smallpox, a disease which carried off millions in the old country and also plagued the New World; six times during the eighteenth century it had almost devastated the country. Interested in attempting to control the disease, Mather obtained the assistance of Dr. Zabdiel Boylston of Boston, one of the best known and most highly respected physicians of his day. Dr. Boylston made his first experiments on his own son and two negro servants. The experiments seemed to be successful, so during the epidemics of 1721 and 1722 he inoculated 247 people in Boston;

other physicians inoculated 39 more. Amazingly enough, only six of these 286 died, while of the 5,759 Bostonians who had the disease during these two years 844 died, and, of course, many of those who survived were either hideously disfigured or broken in health. Inoculation appeared to be successful, but—

Dr. Boylston was considered an outcast by his own profession.

Editors and preachers alike bitterly assailed him. Cotton Mather's house was bombed.

The Massachusetts House of Representatives passed a bill prohibiting inoculation.

Governor Clinton of New York in 1747 proclaimed that it was, "strictly prohibited and forbidden all and every of the Doctors, Physicians, Surgeons, and Practitioners of Physick . . . to inoculate for the smallpox any person or persons within the City and County of New York, on pain of being prosecuted to the utmost rigour of the law."

However, the practice increased, and later George Washington, one of its supporters, required all army recruits who had not had smallpox to be inoculated. And Benjamin Franklin, who at the age of sixteen, with his brother James, had violently opposed inoculation in their "New England Courant," promoted the first hospital in the colonies and became an ardent supporter of inoculation.

It is interesting to note that, although Cotton Mather was a vigorous advocate of inoculation, his sympathies did not include the Indian; he considered the fifty per cent smallpox fatalities of the red men as a sort of "special divine providence to protect the white men."

THE INVENTION OF FRESH AIR

Edward Livingston Trudeau, a country doctor, read how in 1882 a German bacteriologist, Robert Koch, had isolated the tubercle bacillus. Desiring to learn more about it, Trudeau went to New York, where he was shocked to find that Koch and his discovery were scoffed at by doctors. Undaunted, Trudeau studied microscopic technique and with only a sink for a laboratory soon confirmed Koch's findings.

In those days there were no tuberculosis sanitariums, only a few "pest houses" for those patients who were considered incurable. Trudeau decided to do something, and so in 1884 founded his sanitarium at Saranac, the first institution of its kind in the United States. This one-room sanitarium was exceedingly crude. It had no running water and no laboratory, and Trudeau himself had no nurses or trained helpers. In attempting to find a suitable drug or specific, he experimented with rabbits and guinea pigs. After six years of failure he turned to his original formula—fresh air, rest, and courage. He was called a "quack," a "fool," and worse.

BUT—Edward Livingston Trudeau lived to see his unique contribution—"the invention of fresh air," become widely adopted in tuberculosis therapy, and also the number of sanitariums in the United States increase to a total of 386. Trudeau died in 1915. Now there are 732 such sanitariums with a total of more than 200,000 beds.

HE-GRANDMOTHER

During the time of Hippocrates the midwives were a well organized group with clearly defined duties. Their methods of handling lying-in women were at

times rough. . . . They were regulated by the physician, and in difficult deliveries he was called in to assist, although at this stage of civilization contempt was attached to this personal participation of the physician; he was called a "he-grandmother."

Years later men were excluded entirely from these birthday parties. And this exclusion of men from the study of child-bearing woman rose in some instances to fanatical heights. Dr. Wertt of Hamburg, in 1522, put on the dress of a woman to attend and study a case of labor. As a punishment for his impiety he was burned to death.—HOWARD W. HAGGARD, "Devils, Drugs, and Doctors," pp. 17, 18, 29, Harper & Brothers, 1929.

GOD SAVE THE QUEEN

In 1591 a woman of rank was burned alive on Castle Hill in Edinburgh, Scotland, because she sought relief from the pains of childbirth. This was during the reign of Queen Elizabeth and when William Shakespeare, Sir Walter Raleigh, and many other distinguished men were making lasting fame, and nearly one hundred years after the discovery of America.

Two and a half centuries rolled by, and then in 1847 in the same city for the first time in the world's history modern anesthesia was used to relieve the pains of childbirth. The doctor, James Y. Simpson, professor of obstetrics at the University of Glasgow, was denounced by the clergy as acting contrary to Holy Writ. Pain, said they, particularly the pain of childbirth, was the ordained lot of mankind; to prevent it was sacrilege. The medical profession criticized and scoffed at his presumption.

The storm of abuse raged until Dr. Simpson was

called to Windsor Castle to deliver Queen Victoria under the then newly discovered anesthetic, chloroform. On the door of his lecture room was placed this notice: "Prof. Simpson has gone to London to deliver the Queen." Under this notice, someone, probably a student, wrote, "God Save the Queen." However, her majesty was so pleased with the success of the venture that she knighted the worthy doctor.—*Parent's Magazine*, February, 1938.

FLYING IN THE FACE OF THE OLD TESTAMENT

Every now and then some one attacks the wisdom of relieving maternal suffering. In one form or another these attacks have been going on for ninety years—ever since Sir James Simpson began giving chloroform to relieve the final agonies of labor. His action was roundly denounced by religious folk for flying in the face of the Old Testament. A few years ago Dr. Ray Lyman Wilbur, Secretary of the Interior in President Hoover's cabinet, criticized the "self-indulgence" of women in asking civilization to lift their ancient burden. He added, "I think the high death rate (of American mothers) can be traced directly to the widespread use of methods to ease the pain of nature's process."—HELENA HUNTINGTON SMITH, *Less Painful Childbirth*, *Delineator*, September, 1934.

BEATE YE DEVILE OUT OF HIM

Up to a century and a half ago an insane person was considered "possessed with a devil," or a number of various kinds of devils, and common "treatment" was torture in order to "beate ye devile" out of him.

Dr. Philippe Pinel in 1791 published a booklet in which he explained that insane people are really only

mentally ill, and advocated more humane treatment for them. "Torture," said he, "only aggravates their disease." After many refusals, the Commune finally allowed him to experiment with a number of inmates in the prison at Bicetre. He began with a few of the most violent, released them from their dungeons, took them outside, and fed and entertained them. He himself was astounded at the results. Although the men were still insane, their violence had disappeared. Then he experimented with other cases, diagnosing each carefully before deciding on treatment. And he was always as amazed as the jailers at the improvement made.

Opposition of all types—skepticism, scoffing, ridicule, and even downright violence—greeted his efforts. But Dr. Pinel persisted and began the movement which ultimately resulted in hospitals and kindness, instead of jails and brutality, for the mentally ill.

THAT'S OBSCENE

About forty years ago Bernarr Macfadden published some material on syphilis in his magazine, *Physical Culture*. For this he was convicted on an obscenity charge, fined \$1,000, and sentenced to a year in Atlanta penitentiary. While awaiting for his appeal to be heard, he toured the country, rousing public opinion so ably in his own behalf that President Taft remitted his sentence, although he allowed the fine to stand.

BUT—the United States Government is now urging magazines to do what Macfadden was convicted for doing four decades ago.

The National Venereal Disease Control Act, passed in May, 1938, authorized three millions of federal as-

sistance the first year, five millions the second, and seven millions the third, and "thereafter such amounts as may be necessary." In 1939 this federal assistance was augmented by state appropriations totaling seven millions.

Departments for venereal diseases have been set up in thirty-two states.

Free and part-pay clinics increased from 800 in 1936 to 2,500 in 1939.

About 250,000 patients sought relief in 1939, 67 per cent more than in 1938, and 103,000 were discharged from the publicly-assisted clinics with their disease cured or safely arrested.

In forty-three states every doctor is supplied with drugs without cost to him or his patient.

Blood tests in 1,823 state-controlled laboratories increased from 2,064,000 in 1936 to 5,600,000 in 1939.

—FULTON OURSLER and THOMAS PARRAN, "Progress in The War Against Syphilis, Bernarr Macfadden's True Story," *Reader's Digest*, September, 1937 (plus later data).

A TRIVIAL MATTER TO SUFFER

Although there was great disagreement as to who really discovered ether—Dr. Horace Wells, Dr. Crawford W. Long, or Dr. William Thomas Green Morton—there was practically no disagreement in the reaction taken towards it. Dr. Morton, an American dentist and surgeon, was the first person to give a public demonstration of the use of ether as an anesthetic—a word which, incidentally, was coined by Dr. Oliver Wendell Holmes.

When the news of this operation had spread, Dr.

Morton received letters from all over the world upbraiding him for being a "quack," a "humbug," a "publicity-crazy mesmerizer," a "friend of criminals," a "fool," and an "infidel." And, in addition, he received communications and visits from the members of his profession, who politely but coldly questioned the accuracy of his experiments.

An eminent physiologist expressed his doubt in these words: "It is a trivial matter to suffer, and a discovery whose object is the prevention of pain is of slight importance." Apparently many other professional men agreed with him, because a number of public medical institutions barred their doors to the new discovery.

"Pain," said many doctors, "is salutary and therefore relieving it would be perilous to the patient."

"Pain," said the clergy, "is but a natural and intended consequence of original sin, and therefore any attempt to do away with it must be wrong."—From R. M. DEVENS, "Great Events of the Greatest Century," Chapter XL, Hugh Heron, Chicago, 1885.

NO WIG, NO JOB

In the year 1762 there was a vacancy on the staff of the Necker Hospital in Paris. A young physician named Jean Nicolas Corvisart presented himself before the board of governors and applied for the post. His medical qualifications were excellent, his recommendations the best. But he was refused the position. He was rejected because he wore no powdered wig!

And this was the same un-wigged gentleman who later contributed some important translating of medical works, originated the movement for a more careful and painstaking diagnosis, popularized percussion

convicted of killing bats, and put up more bat houses. In consequence, San Antonio has long had a clean bill of health so far as malaria is concerned.—*The American City*.

DR. WILL AND DR. CHARLIE

St. Mary's, Rochester's first hospital, was opened late in 1889 with high hopes but only thirteen patients. The first year and a quarter Dr. Will and Dr. Charlie performed 219 operations during the mornings, attended to their general practice afternoons and served as male nurses nightly.

They were not allowed to work in peace. The American Protective Association, an anti-Catholic organization, bitterly assailed their alliance with a Catholic institution. Some Catholics, in turn, upbraided the Sisters of St. Francis for turning over control of the hospital to the Protestant Mayos. But St. Mary's, disregarding the attacks, lived on, and is today the largest of the half-dozen hospitals independently owned but affiliated with the Mayo Clinic.—EDWARD M. BRECHER, DR. WILL and DR. CHARLIE, *Scribner's Commentator*, July, 1940.

IX

EXPLORATION, SCIENCE AND EDUCATION

EXPLORATION

WHO COULD BELIEVE SUCH THINGS?

Marco Polo, the greatest, probably the most accurate, and certainly the most interesting of mediæval travelers, returned to Venice from his amazing journey across the deserts of Persia to the dazzling court of the Great Khan, only to meet with incredulity and to acquire the insulting sobriquet of "Marco milioni," Marco of the Millions. His story, which has since been verified in most of its details, was incredible. Who could believe in such things as paper money, printed books, black stones which burned, and nuts as large as a man's head? For many years after his return every carnival of Venice was enlivened by the preposterous antics of a clown who impersonated "Marco milioni."—From ARTHUR D. LITTLE, "New Lamps for Old," *The Technology Review*, October, 1931, Massachusetts Institute of Technology.

ONLY A FEW ACRES OF SNOW

Canada is the largest country in the Western hemisphere, 400,000 square miles larger than Brazil, and 660,000 square miles larger than the United States. It is the second largest country in the world; only Russia is larger. And yet, Voltaire, who was a prodigious sneerer, once dismissed Canada as "only a few acres of snow."

LET NOT MAN PUT ASUNDER

Ever since explorers first sketched the outlines of the Western Hemisphere, and noted how the northern and southern sections were joined by only a small neck of land, they thought about the possibility of digging a canal across this little strip, thus materially shortening the trip from the Atlantic to the Pacific. And, in fact, when such a canal was proposed to King Philip II of Spain he at once saw the possibilities; Spain controlled the earth, such a canal would help to centralize control; Indian labor could be had for practically nothing except the mere feeding. It appeared to be a great idea.

So, as was customary, Philip called in his spiritual adviser, the Archbishop of Madrid. This dignitary listened impatiently to the explanations of the King and his admirals, shook his head, and said pompously, "What God hath joined together, let not man put asunder." It was not until more than three hundred years later that the Panama Canal became a reality.

NO ADVICE NEEDED

Back in 1513, Ponce de Leon on his voyage to Florida was startled to find that in spite of strong favoring winds his ship was actually driven back by the motion of the water. In colonial times British authorities, annoyed by the slow time made by their mail packets on the westward Atlantic crossing, took the matter up with our own Benjamin Franklin. Dr. Franklin put his scientific mind to work, talked with experienced Nantucket captains, and learned enough to chart the stream, giving it the name, Gulf Stream, which it still bears. He informed the British that

westbound vessels which avoided the Gulf Stream would gain at least two weeks over ships that sailed against it. But it was a long time before the proud sea captains of England deigned to accept his advice. Today great liners coming from Europe go out of their way to avoid the drag of the Gulf Stream, while gladly accepting its help on the eastward journey.—A. H. Z. CARR, *Frontiers*, April, 1939.

HE WOULDN'T TRADE FOR OREGON

When James K. Polk was elected president in 1844, the United States and England were close to war over the question of our northwest boundary line. England wanted "Oregon," which included what today is Washington, Oregon, Idaho, and part of Wyoming. The Americans wanted the 49th parallel, which is our present boundary.

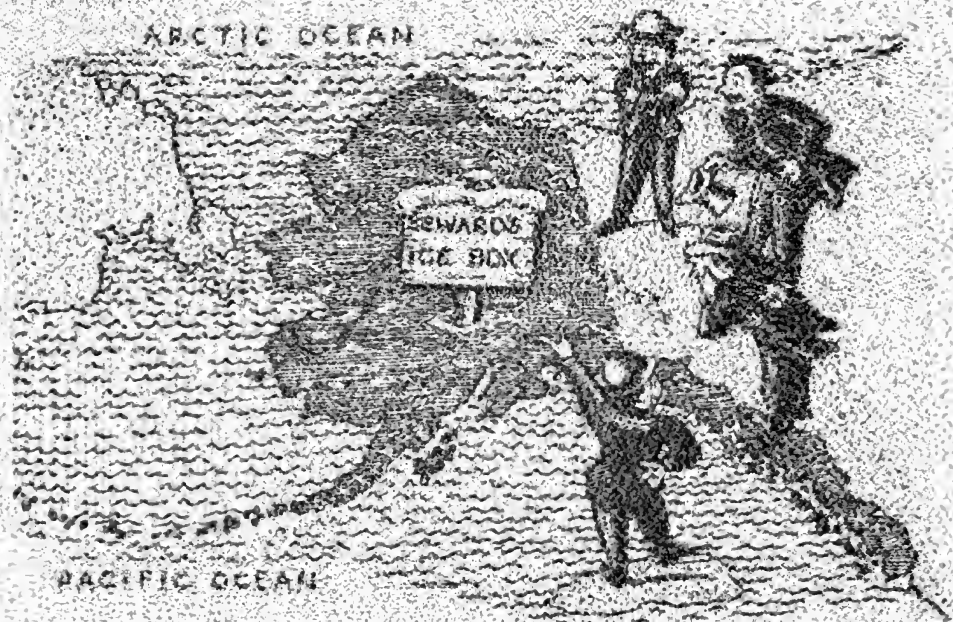
Because authentic knowledge about the country was meager, England sent Captain John Gordon to look it over and see if it was worth fighting for. Upon his arrival the pompous Gordon was entertained in lavish style—lavish for the frontier. However, he found that halfbreed servants were not as skillful as English butlers; crude beds were not as comfortable as those at home; "still hunting" of deer was not as good sportsmanship as running them with dogs. The last brittle straw of his patience broke when he asked for a bath—and was courteously led to the shore of the Pacific and invited to walk in!

Captain Gordon had learned enough. He stormed aboard his ship and set sail for England, away from this grim land fit only for savages. At home he declared he "wouldn't give the bleakest knoll on the bleakest hill of Scotland for all of Oregon's moun-

tains in a heap." His word was accepted without question. England abandoned all thought of war and accepted the 49th parallel as the boundary.—CLAY OSBORNE in *The American Mercury*, June, 1939.

SEWARD'S ICEBOX

In 1867 Secretary Seward bought Alaska from Russia for \$7,200,000. This transaction was dubbed "Seward's Folly," and Alaska itself was called "Seward's Icebox," and "The Icebox of the North." Everyone knew that it was a wasteland of ice and snow on which lived only many wolves and a few Eskimos.



Now that we own it, what'll we do with it?

BUT—Less than three per cent of Alaska is always under ice and snow.

Some Alaskan towns are cooler in summer and warmer in winter than St. Louis, Chicago, New York. Alaska is in the same latitude as Sweden and Finland.

Alaska covers 586,000 square miles, 65,000 of which are suitable for farming. It has known riches in gold, silver, copper, and the only United States tin deposits.

In southeastern Alaska, within five miles of tide-water, enough timber can be cut annually to supply one quarter of the newsprint needs of the United States in perpetuity, without denting the forests. Salmon fishing, the principal industry, now tops any other fishery in the world; the shrimp, herring, and shellfish industries are still under-developed. Yukon mink bring the highest world prices, and production could expand without sinking the world price.

The Pribilof Islands with their vast seal herds were also acquired with Alaska. The seal pelts alone have yielded more than ten times the purchase price paid for Alaska.—*Time*, August 28, 1939.

In 1930, General William B. Mitchell told a Senate Military Affairs Committee, "Alaska is the key point to the whole Pacific Ocean. It almost touches Asia. . . . I think Alaska is the most important strategic area in the whole world."—*Scribner's Commentator*, January, 1941.

RIDICULOUS!

On one occasion, while president of the United States, Thomas Jefferson said, "I am convinced that, some day, the country west of the Mississippi River will be valuable." For making this "ridiculous" statement, President Jefferson was pooh-poohed and scoffed at by newspapers throughout the East.

COLTER'S HELL

In 1871, John Colter, explorer and trapper, came

back to civilization with a wild story of a strange land in which there were hot springs, fountains of boiling water which spouted up intermittently with the regularity of clockwork, odd, rugged formations, and enormous white waterfalls. The tale was so unreal that the whole nation laughed, and referred to this unexplored part of our country as "Colter's Hell."

However, one man didn't laugh. He, William Henry Jackson, artist, explorer, archeologist, photographer, and father of the modern picture post card, had heard similar stories from the Indians. Later, with an escort, his survey party discovered—the Mammoth Hot Springs, the Norris Geyser Basin, Canyon of the Yellowstone, the Great Falls—wonders even greater than Colter himself had described.—Adapted from KARL DETZER, "Portrait of a Pioneer," *The Washington Post*, May 7, 1939.

SCIENCE

I TAKE IT ALL BACK

For centuries man was forbidden by clerical authorities to teach any doctrine concerning the earth's origin, age, shape, and motions that appeared to be in conflict with "Divine Revelation" as recorded by Moses. And many were the scientists who were punished for venturing to believe otherwise.

For instance, even less than two hundred years ago the great French naturalist, George Louis Leclerc Buffton, courageously taught and published the simple facts of geology, showing what every child now knows, that the earth is millions of years old. He was compelled by the authorities of Sorbonne to publish the following denial: "I abandon everything in my book

respecting the formation of the earth and generally all which may be contrary to the narrative of Moses."

ANYBODY CAN SEE THAT THE EARTH IS FLAT

Columbus believed that the earth was a globe, considerably smaller than he later found it to be, and also that he could get east to Asia by sailing entirely around the earth. Being too poor to fit out an expedition himself, he tried to interest his own countrymen. They laughed at him. The great Aristotle had taught that the earth was flat, and moreover, anybody could see that by looking! Columbus then turned to Portugal, and then to Spain, meanwhile sending his brother to England. And here again, as every school child knows, Columbus was jeered and scoffed at, even children mocking him as he passed in the street.

BUT—after seven years of discouragement, when Columbus was leaving Spain, a messenger came from Queen Isabella asking him to return. She was interested in Christianizing Asia, and was willing to pledge her jewels to raise the necessary funds. Columbus was right—the earth is round.

NO ONE DOUBTED THE GREAT ARISTOTLE

Aristotle and his followers taught that bodies fell in proportion to their weights—a body five times as heavy as another fell five times as fast—and this apparently logical principle was accepted without question for nearly 2,000 years—from about 340 B.C. to 1590 A.D.

However, a professor of mathematics at the University of Pisa, Galileo Galilei, began to doubt this long-accepted principle and decided to check on it. With a liberal supply of assorted sizes of cannon balls

and bullets, he climbed the spiral stairs of the Leaning Tower and dropped the missiles—not once, but many times, and in a number of different combinations—carefully noting their fall. He discovered that except for the fraction due to the resistance of the air, they struck the ground at the same time, which meant that they fell at the same speed. These experiments were witnessed by a number of Galileo's more curious colleagues.

Soon the attention of the University authorities was called to this disagreement with the teachings of the great Aristotle, and these worthies got their heads together, denounced Galileo, and then made every witnesser of the experiments swear that nothing unusual had happened—the weights fell exactly as Aristotle said they would. Galileo stood by his proof and as a result was labelled a nuisance and a doubter and was shortly dismissed from the teaching staff of the University.

It so happened that a number of non-university people also had watched the experiments. These, too, noted that the objects struck the ground at the same time, irrespective of their weights. Because the University had no control over these individuals, it was unable to force them to take the oath it required of the professors. Soon the story was about the city, and in order to combat it the clerics put out the propaganda that Galileo had bewitched the weights, and consequently they had not acted as they normally would.

HE WAS BURNED AT THE STAKE

Giordano Bruno was a famed Italian philosopher and astronomer of the sixteenth century. After many

years of wandering, thinking, writing and teaching, he came to the conclusion that the Aristotelian conception of the universe was wrong, and accepted the Copernican theory, which allowed for a plurality of worlds. When it was pointed out to him that this was in direct contradiction to the Scriptures, he insisted that the Scriptures were designed to teach morals only, and not scientific truth. In 1593 the emissaries of the Inquisition arrested him and took him to Rome, where, after being held in prison for seven years, he was excommunicated and burned at the stake.

HE HAD TO RECONT

Galileo was a distinguished Italian astronomer (often called the "father of descriptive astronomy") and experimental philosopher. Having heard about the invention of the telescope and having seen a pair of toy glasses made by Lippershey, a Dutch spectacle maker, Galileo made a telescope for himself out of a three-foot piece of organ pipe with a lens at each end. With this and later improved telescopes, Galileo studied the heavens and came to the conclusion that the earth, instead of the sun, moved—that is, that the earth moved around the sun. This was, of course, in direct contradiction to the accepted teaching of the Scriptures, and Galileo was semi-officially warned to "avoid theology" and limit himself to "physical reasoning."

The following year the consulting theologians of the Holy Office characterized the proposition that the sun is immovable in the center and that the earth rotates around it, as heretical, and shortly thereafter Galileo was admonished by Pope Paul V not to "hold, teach or defend" this condemned doctrine.

Galileo promised to obey this papal injunction. However, sixteen years later he published his famous book which immediately brought applause from throughout Europe. Eight months later the sale of the book was prohibited by church decree, and Galileo was called to Rome by the Inquisition. He pleaded his age and infirm health, but no excuse was admitted. He went to Rome, was examined by the Inquisition, threatened with torture, and forced to kneel and recant his heretical beliefs. He spent the last seven years of his life under very severe restrictions—virtually a prisoner.

THE FROGS' DANCING MASTER

In 1762, while Galvani was engaged in the experimental research of the reaction of frogs' legs to electric shocks, he is said to have declared: "I am persecuted by two classes; the scientists and the know-it-alls. Both call me 'the frogs' dancing master.' Yet I know that I have discovered one of the greatest forces of the universe."—HORNELL HART, "The Technique of Social Progress," p. 629, Henry Holt & Company, 1931.

EDUCATION

DANGEROUS FREEDOM

Because his own childhood had been unhappy, Friederich Wilhelm August Froebel, a forester and architect, after several years of thought and study, during which time he wrote his famous book, "The Education of Man," opened (1837) a school for young children. The materials and methods of this school

at Blandenburgh were based on "the play spirit." He called it a "small child occupation institute," and later "shouted for joy" when he thought of the name "kindergarten"—children's garden.

The school was immediately successful. Educators flocked to him, and soon imitations of his kindergarten sprang up in Switzerland, France, and England, as well as in his own country.

However, Froebel met with stiff opposition. Religionists said he was "a gray-haired old man who never goes to church," and traditional-minded educationists railed at his "playing with children and calling it education." Following the "year of revolutions" (1848) Froebel was suspected of irreligious and socialistic tendencies, and his schools of "encouraging dangerous freedom," and in 1851 all kindergartens in Prussia were abolished by Raumer, the minister of education. Froebel died the following year.

BUT—today in America more than 600,000 four- and five-year-old children attend kindergartens, thanks to a "gray-haired old fool."

AN IGNORAMUS FROM THE FARM

By 1837 the schools of Massachusetts were in a shameful state—unqualified teachers, antiquated buildings, little equipment, inadequate financing. Then Horace Mann, a public-spirited Boston lawyer, became Secretary of the Massachusetts School Board. Recognizing the low state of educational affairs, he wrote, "Neither the art of printing, nor the trial by jury, nor a free press, nor free suffrage can long exist without schools for the training of teachers; for if the character and qualifications of teachers be allowed to degenerate,

the free schools will become pauper schools, and the pauper schools will produce pauper souls, and the free press will become a false and licentious press, and the ignorant voters will become venal voters, and through the medium and guise of republican forms an oligarchy of profligate men will govern the land."

In line with his theories, Mann energetically began a vigorous constructive program which included teacher-training schools, school libraries, free textbooks, secularization of teaching, and free public education.

To provide funds he sold his own library, begged from friends, and "worried" the legislature until he received help from it. He spent \$1,000 of his \$1,500 a year salary for the cause. He did not even have a clerk. Naturally, as a result of his work, education in Massachusetts began to improve.

However, Mann had bitter opposition—political, religious, financial, and educational. His program was called "godless," and he was called a "political bluffer," a "crank," and an "ignoramus from the farm."

BUT—to Horace Mann, more than to anyone else, can be credited our great modern American school system.

PUBLIC SCHOOLS ARE GODLESS SCHOOLS

The early American schools were controlled by the Church and were dominated by the religious motive, and the right of the Church to dictate the teaching was clearly recognized by the State. The State even assisted the Church with money grants. The minister, as town official, naturally examined the teachers and the instruction in the schools. However, after the establish-

ment of our national government, there came a movement for the secularization of the schools because of:

1. The conviction that the life of the Republic demanded an educated and intelligent citizenship, and hence the general education of all in the common schools controlled by the state.

2. The great diversity of religious beliefs among the people, which forced tolerance and religious freedom through a consideration of the rights of the minorities.

The appearance of the public school—dedicated to democratic and national, instead of religious, ends—brought violent attacks in all parts of the young republic. The common cry was, "The public schools are Godless schools"; and it was insisted that school authorities were "attempting to make the schools a counterpoise to religious instruction at home and in the Sabbath schools." Legislative petitions, mass-meetings, and riots were common. Even one political party, The Native American Party, was formed in 1841 "to prevent the union of Church and State, and to keep the Bible in the schools."

But sentiment for the state-supported and state-controlled school continued to develop, and to satisfy the supporters of the sectarian idea, most states made substantial financial contributions to the church-supported schools. However, this practical expedient proved unsatisfactory, and ultimately legislatures prohibited it by legislation, or states prohibited it by constitutional amendments. By 1850, with the establishment of a definite policy of state responsibility for education, the matter was fairly well settled, and no state admitted after 1858, with the exception of

West Virginia, failed to insert a constitutional provision which forbade a diversion of public funds to sectarian schools.—E. P. CUBBERLEY, "The History of Education," pp. 691-695, Houghton Mifflin Company, 1920.

NONE OF YOUR HIGH SCHOOLS FOR ME

In 1827, six years after Boston had opened its English High School—the beginning of the high school movement in America—the legislature of Massachusetts passed a law requiring every community of 500 families to provide and maintain a secondary school for ten months of the year. Naturally, this legalization of the high school met with a great deal of opposition. On the other hand, its influence was felt in other states shortly thereafter. O. B. Griffin recently made a study of the debates of the time, and records such much-used and much-emphasized expressions of the opponents as, "no taxation for other people's children;" "what was good enough for the father is good enough for the son;" "vested rights of the parents;" "let well enough alone;" "steady habits in the good old ways;" "none of your high schools for me." ("The Evolution of the Connecticut State School System," *Teacher's College Contributions to Education*, No. 293, 1928.)

Despite much opposition and unfavorable public sentiment, the movement for free public high schools continued to grow throughout the nation. Finally, in 1872, came the famous "Kalamazoo Case," which set a precedent that has been followed in all other states when this issue of a public secondary school was raised. In that year a citizen of Kalamazoo went to court and

argued that "there is no authority . . . to make the high school free by taxation levied on the people at large . . . instruction in the classics and in the modern living languages in these schools should be considered in the nature, not of practical and necessary instruction for the benefit of the people at large, but rather as accomplishments for the few, to be sought after in the main by those best able to pay for them, and to be paid for by those who seek them, and not by general tax."

BUT—the court decided against his contention and thus set a precedent. And, in 1941, according to the United States Office of Education, there were 16,260 public 3- and 4-year high schools, 2,372 junior high schools, and 6,203 junior-senior high schools—a total of 24,835 public high schools in the United States.

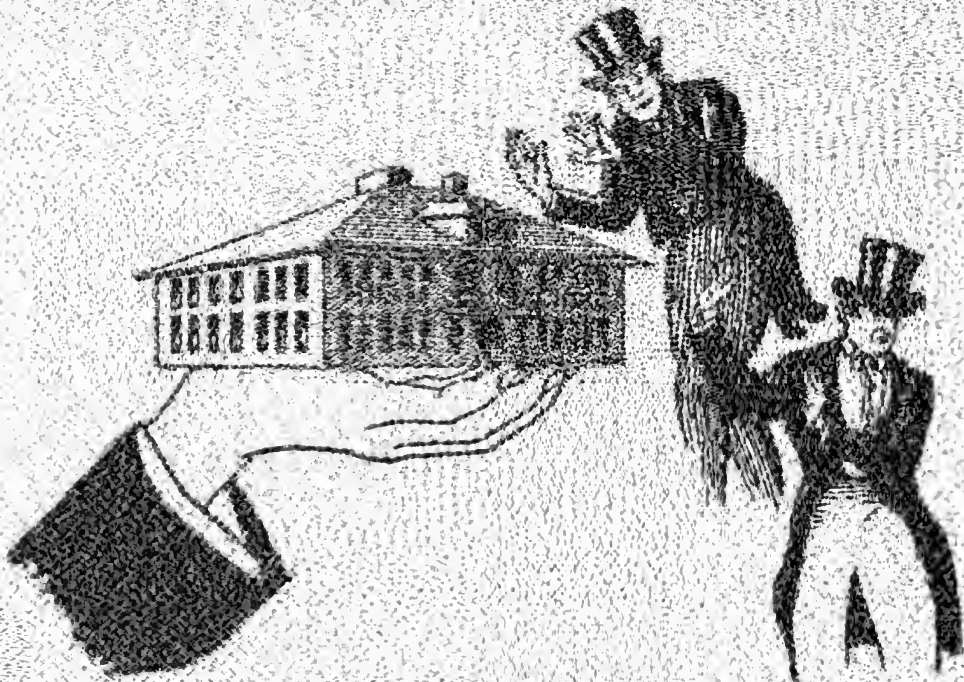
A TRIPLE-PLATED SWINDLE

Some forty years ago David Kemp, a former salesman, construction engineer and publisher, founded the United States School of Music, a correspondence school of music instruction. As a youngster he had "picked out some tunes by himself," and too, he knew that some of the world's greatest musicians were self-taught, so he believed that with the assistance of music teachers he could develop a method that would make music instruction available at low cost to anyone anywhere. He developed his plan, and was himself surprised to see four hundred students enroll during the first year.

However, he met vigorous opposition. The whole idea was outlandish to professional musicians. Some music journals refused to carry his advertising. An article in one of these magazines classed all correspondence schools as swindles, but saved its best evalu-

ation for music courses by correspondence, which it termed "a triple-plated swindle."

Immediately, Kemp brought suit for damages. At the trial both Walter Damrosch and Lewis Sevensky testified that it was impossible to teach music by mail. For a part of his evidence Kemp staged demonstrations



Nope, not interested.

by several of his mail-taught students. The jury disagreed, but newspapers favored the plaintiff. Even several of the courtroom listeners at once enrolled in Kemp's school.

AND—now some thirty music courses are offered by a dozen large, and several times this number of smaller, mail-instruction concerns.

HIGHER EDUCATION OF A LOWER TYPE

Many of us can recall the critical blast that went up from professional educators when, in 1920, Arthur

E. Morgan became president of Antioch College and began a program of "Higher Education of a Lower Type"—as one newspaper headlined it, a deliberate break with the established traditions and customs of collegiate education.

Some of the items on his program were: no entrance examinations (the candidate's qualifications were considered in the light of his autobiography and his teachers' estimates) ; no varsity football; no school yells; no fraternities; no hazing of freshmen; student budgeting of time and money; a six-year course; ten-week actual practice in positions alternating with ten weeks of classroom instruction.

BUT—when they graduate, 95 per cent of the students know exactly what they want to do with their lives. Ten years after graduation nine out of ten have stayed in their chosen profession. Recently 54 out of 56 young men and 30 out of 35 young women stepped right into positions for which they had been trained, many with employers who had watched them at work.

X

LITERATURE, MUSIC AND ART

LITERATURE

THEY STUDY NOVELS!

Fifty years ago, when William ("Billy") Lyon Phelps began to teach English there, Yale was a strictly classical, starched-shirt, frock-coated institution. Phelps recklessly asked for and, amazingly enough, received permission to teach a course in contemporary novels. Still more amazing, his first class numbered 250 students. A feature story on the course by a New York newspaper brought a blast of opposition from all parts of the country. "Trash," "worthless," "undignified," "a waste of time," and "educational heresy," were some of the published evaluations of it. "They Study Novels!" headlined one newspaper story. The course was immensely successful, but was dropped at the end of the term. Unsympathetic President Dwight stated, "There would have been no objection if it had been a failure."

APOLOGIZE OR LEAVE THE UNIVERSITY

In 1878 a troupe of show people arrived in Morgantown, West Virginia, and presented—for those who dared to attend—a performance of "East Lynne." However, university students were not permitted to go to the theater and were warned especially to remain away from "East Lynne." One night a group of students mustered enough courage to attend a perform-

ance which was held in the chapel of the old Monongahela Academy. Later, those who attended were told to apologize or leave the university. All of them did, except James P. Fitch who later became one of Morgantown's best-known physicians. He could see no reason for apologizing, and was expelled, his diploma only a few months away.

TRASH! TRASH! TRASH!

Harper's magazine rejected—all on one memorable morning—Kipling's "Jungle Books," "Plain Tales from the Hills," and "Soldiers Three," and no less a person than Walter Hines Page, as editor of *The Atlantic*, rejected Edward Noyes Wescott's "David Harum," a novel which later sold a million copies for Appleton. It was *Century* that threw out of the office an obscure young man who later turned out to be Robert Louis Stevenson.

Except for sedate book notices, the literary magazines of an earlier date printed practically no advertising. *Harper's* was greatly insulted when offered \$18,000 for the space on its back cover for sewing machine advertising. It carried no advertising at all, except notices of Harper's books, until 1864. *The Atlantic* accepted advertising—rather condescendingly—after 1860.—John Bakeless, "Aristocrats of Publishing," *Vanity Fair*, August, 1933.

THOSE AWFUL DIME NOVELS

The so-called "dime novels," the blood-and-thunder thrillers featuring the hair-raising exploits of Old Sleuth, Diamond Dick, Old Cap Collier, Rube Barrow, the Younger Brothers, Deadwood Dick, the James Brothers, and similar characters, were first published

in America about 1850. These sensational books—despite their sexless tales of heroic courage, nobleness, honesty, and other virtues—were always roundly condemned as literature for boys and considered “not nice” for even men to read. Erasmus Beadle published most of them from 1860 to 1897, advertising “a dollar novel for a dime.” Boys’ books, which usually sold for “half-a dime,” were published weekly. They, too, were condemned as “those awful dime novels.”

BUT—these thrillers have been given a place of honor in the Rare Book Room of the Library of Congress, and respectfully catalogued as the “first real American literature,” partially, at least, because they give accurate and graphic pictures of life in the pioneer days.

The University of Pennsylvania has obtained from the Library of Congress a catalogue of the names of these books and uses them as a part of the literary course of the college.

And Edmund Lester Pearson, of the New York Library, says in his book, “Books in Red and Black,” that “the old dime novel, compared to the two-dollar ones accepted of today, was chaste, ethical and overflowing with rectitude.”

MUSIC

STOOPED TO SING “OLD FOLKS AT HOME”

The songs of Stephen Foster, America’s most famous composer, are now enshrined as immortal inspirations. But in his own day they were treated with patronizing hauteur by the highbrows. “His tunes,” one musical journal said, “are whistled for lack of

thought, and they must persecute the nerves of deeply musical persons."

Of an artist of those days who did one of Foster's numbers as an encore, a New York critic wrote: "Shame to say, she stooped to sing 'Old Folks at Home.' One would as soon think of picking up an apple core in the street."—Sigmund Spaeth, "Steve Foster of Tin Pan Alley," *The Etude*, November, 1939.

DON'T BE ENTICED

In 1888 Thomas Edison marketed his first phonograph, and within a few years it took the country by storm. That is, it took everybody by storm except the music critics. These dignitaries condemned it as "a great hindrance to musical education," and urged that musical patrons "refuse to be enticed by it." Now, this "hindrance" is used in musical education in nearly every school in the country.

Later came the mechanical piano, and then radio music, and both of these were cursed by the music critics, not only because they represented "mechanical music," but also because, as one worthy stated, "obviously, a person who listens to music will never himself learn to play or sing." Even the manufacturers of musical instruments were worried. But today more than 200 musical instrument factories are producing instruments, music, and equipment, and the annual business is around \$10,000,000.

When the baby grand and apartment pianos appeared on the market, they were railed at by professional musicians, critics, and journals, and called by such uncomplimentary names as "playhouse pianos," "children's toys," "dollhouse pianos," and similar disparaging designations. Their opponents said that due

to their small size they could be nothing else but toys, could "never be really musical in the true sense of the word," as one music journal editor put it.

BEWITCHED WITH SIREN SONG

Music was not permitted in our early churches because the Puritans held that "it bewitched the mind and morals with siren song."

Many of us can remember the days when both piano and violin were barred from churches, largely because they "were commonly used in dance halls, saloons, and similar places of low repute."

THIS ISN'T A NURSERY

Jenny Lind, born in poverty, used to while away her hours by singing to her pet cat. People stopped at her window to listen to the sweet childish voice. Among these listeners was the maid of Mlle. Lundberg, a dancer at the Royal Opera, who told her mistress about it. As a result, the little girl was brought to sing before Mlle. Lundberg, who said at once, "This girl is a genius; you must have her educated for the stage." She was taken to the singing master of the theater, who later confessed that he was moved to tears by the simple songs she sang. He took her to Count Puke, head of the theater, and recommended that she be enrolled as a pupil.

"How old is she?" asked the Count.

"Nine years."

"Nine?" thundered the great man. "This isn't a nursery. This is the King's Theater."

However, ultimately, Jenny was successful in getting into the school, and for twenty years she was educated at government expense.

Years later, the great American showman, P. T. Barnum, contracted with Jenny Lind for 150 concerts in America at the unheard-of fee of \$1,000 per concert, with all expenses for Miss Lind and her party paid. Barnum went to bankers in an effort to raise money with which to begin the campaign. They merely laughed at him, and refused to let him have it. In time, however, Barnum succeeded in raising sufficient funds to bring Miss Lind to this country, planning to pay the heavy expense out of later profits. His friends, who had great respect for his financial ability, thought that Barnum had gone "completely crazy."

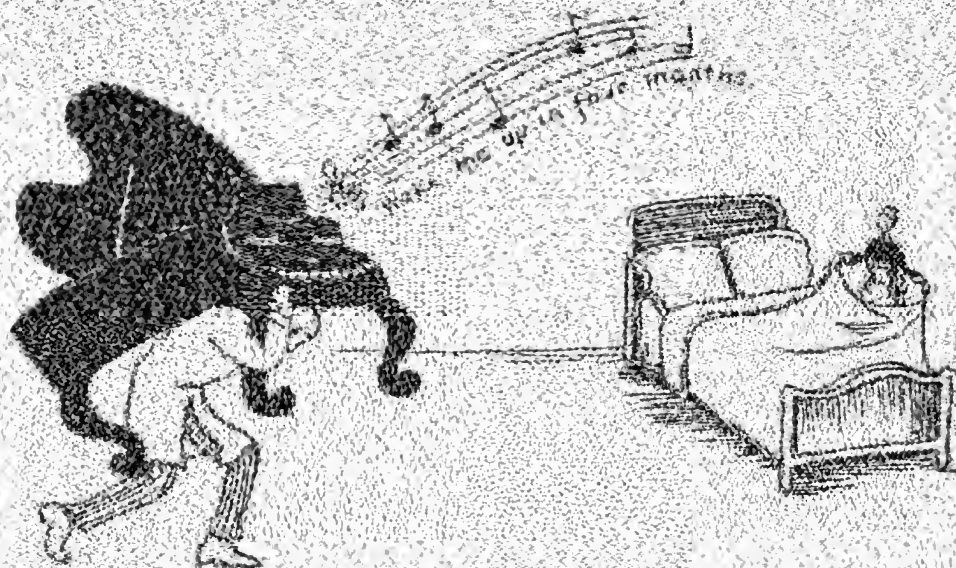
BUT—Jenny Lind's American tour was one of the greatest triumphs a human being ever had in this country. On the evening of September 11, 1850, she gave her first concert in Castle Garden. The tickets were in such demand that most of them were sold at auction on the Saturday and Monday previous. Genin, a hatter, bought the first ticket for \$640. The total receipts of Miss Lind's tour were more than \$700,000. Her own share was around \$250,000, of which she gave away to worthy local and national causes the sum of \$50,000.—R. M. Devens, "Great Events of the Greatest Century," pp. 386-394, Hugh Herron, Chicago, 1885.

MUSIC SLEPT FROM MAY TO OCTOBER

Only two decades ago the musical life of the nation went soundly to sleep from May to October. There were no summer operas, no orchestras, no solo recitals, and no radios. Desperate music lovers could only make music themselves, play their phonographs or go to Europe for the festivals.

In the summer of 1918 Arnold Volpe started an

experiment in New York. Together with a group of musicians drawn from the city's various orchestras, a chorus, and several soloists, he planned a two-week series of concerts in the Lewisohn Stadium, the football field of the College of the City of New York. His programs were to consist of masterpieces, not merely gay waltzes or stirring marches. His friends, musi-



Music went to bed.

cians, critics, and even the general public, predicted failure in capital letters.

BUT—the series was an immediate success. The first two-week season had to be extended to seven weeks; subsequent seasons have been fixed at eight weeks.

And now, during summer evenings, stadia and natural amphitheaters from Back Bay to the Golden Gate have been filled with thousands of people sitting utterly quiet, listening to the symphonies of Beethoven and Brahms, and to the operatic scores of Verdi and Gounod.

Add to the 10,000 at the Lewisohn Stadium as many more in the Hollywood Bowl, the throng in Boston on the Charles River Esplanade, thousands in Philadelphia's Fairmont Park in Robin Hood Dell, and other thousands perched in a hillside amphitheater hearing the St. Louis Little Symphony. There are crowds on the lake shore in Cleveland, in the Cincinnati Zoo, in the beautiful natural amphitheater in San Mateo, California; in Chicago, Newark, Atlantic City, and Portland. Each year new cities toe the starting line, and virtually no series, once launched, has failed for lack of public support.

Listening to music under the stars has become a national pastime.—H. Howard Taubman, "Music Under the Stars," *Today*, July 18, 1936.

HE THREW IT AWAY

Edward MacDowell, one of America's greatest composers, would not accept girls as students because he held that they were poor music possibilities. However, he was persuaded to accept Marian Nevins—the woman who later became his wife. Probably no one was more critical of his compositions than MacDowell himself, and he would throw away a great deal of his work after finding that it did not suit him. Mrs. MacDowell knew about this habit of discarding music scores and kept an eye on the wastebasket. One day she found a scrap that to her musical eye looked promising, and so she saved it and urged her husband to develop it. He did, and today it is probably MacDowell's best known piano composition, "To a Wild Rose."

DEMON JAZZ, THE DESTROYER

I found (says Paul Whiteman) . . . that compara-

tively little has been written in an analytical way about jazz, as music; the criticisms, constructive and otherwise, of so-called jazz manners and morals would fill a library. Illustrative of these are the following:

"Jazz music causes drunkenness."—Dr. E. Elliott Rawlings.

"The next generation will see women old in their twenties, unless the jazz tendency is halted."—President of the Christian and Missionary Alliance Conference.

"The jazz band view of life is wrecking the American home."—Professor Herman Derry.

"The objection of the physician is the effect that jazz has on certain human emotions. . . . If we permit our boys and girls to be exposed definitely to this pernicious influence, the harm that will result will likely tear to pieces our whole social fabric."—Dr. Florence H. Richards, medical director of the William Penn High School for Girls, Philadelphia.

A Canadian physician produced statistics to show that jazz had doubled insanity in the United States.

A specialist in diseases of the ear and throat declared that if the epidemic of "bees knees," "Apple Sauces," and "Dadas" continued, a whole nation would be overwhelmed with ear paralysis.

Judge Lambertson of Illinois said that three-fourths of the divorces in his court were caused by jazz.

Thomas Edison was quoted as saying that he usually played jazz records backwards because they sound better that way.

In a small Nebraska town jazz was classed as a public nuisance.

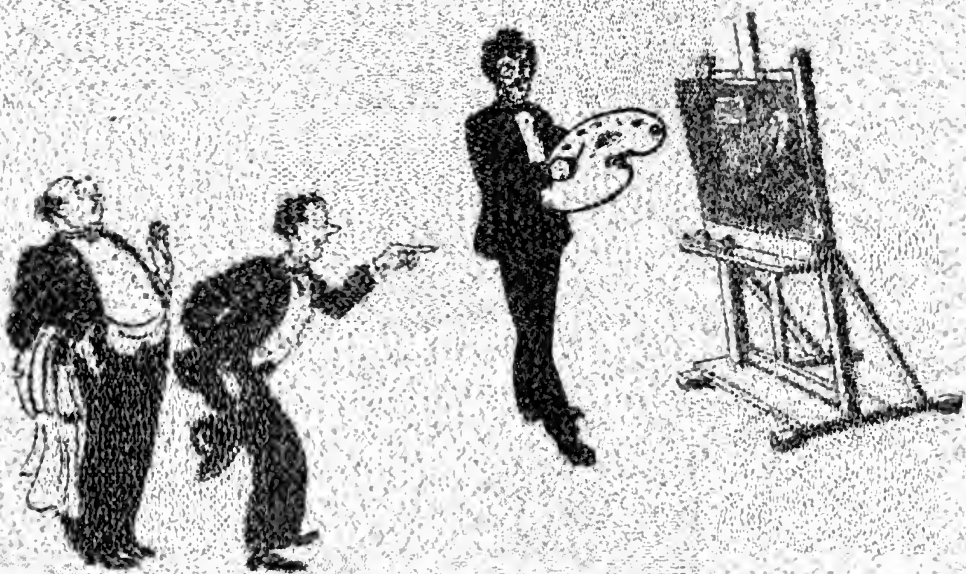
Not far away, in Kansas, a determined historian

found in jazz a new cause for the fall of the Roman Empire. — Paul Whiteman and Mary Margaret McBride, "Jazz," Kingsport Press, Inc., 1926.

ART

NOBODY BOUGHT "MOTHER"

James McNeil Whistler was the most brilliant American artist of his day, but he was not accepted to any great extent in England, where he lived, and was hardly even known in this country. After failing to



Poor old "Mother."

sell his "Mother" in England, he sent it to the United States but no one was interested so it was returned to him. Later he sold it to the French government, and

NOW—"Mother" is one of the best known of the world's masterpieces.

AND NOW A MUSEUM

Jean Veber was a famous master of the grotesque.

He saw basic principles clearly and with rare courage slashed away at the follies of mankind—economic, social, political, industrial, educational, and religious in his “social cartoons.” His efforts were scoffed at as the work of a twisted mind, and were thrown out of art galleries, where they had been virtually slipped into exhibition. Veber was not only scored by art critics but also by those who favored established traditions in the various areas of human life. In short, he was considered a deep-dyed “red” of brilliant hue, and was cordially hated and feared. About a decade ago Veber died, broken-hearted because of the vicious attacks of his detractors.

BUT — the city of Paris has just recently established a museum in his honor, a belated recognition of the genius of this great artist.

AN INSULT, BUT THEODORE ROOSEVELT TALKED WITH IT

After completing the famous Harrisburg group for the new capitol of his native state, Pennsylvania, George Grey Barnard was commissioned to do Lincoln. Plunging into years of research, he covered the whole train of the Emancipator’s life. He poured over photographs, even finding a few that had not been retouched, and out of these years of study came his statue.

The clothes which he put on the tall ungainly Lincoln were as untidy as were Lincoln’s in life. One bony hand, which was made from actual life casts, clasped the other wrist over the abdomen, a favorite posture. The feet, designed after the measurements as given by

Lincoln's shoemaker, were grotesquely large.

The statue when unveiled in Cincinnati aroused a storm of controversy. Robert Todd Lincoln called it an insult to his father's memory. American artists rose up against its uncouthness; "Even though, perhaps, it does show Lincoln as a man of the people, yet the thing itself is grotesquely monstrous." Naturally, the long fight made upon Barnard because of this statue brought him great unhappiness.

BUT—the statue was so real to Theodore Roosevelt that he stood before it and for minutes earnestly talked with Lincoln.

And Barnard himself, although he never forgot the scoffs, had the satisfaction of clearing \$130,000 by the replicas of this statue, which he placed in many museums.—Dan Williams, "Visions in Marble," *The North American Review*, Summer, 1937.

THIS MADMAN EVEN BURNED HIS FLOORS

Bernard Palissy, born in 1810, was the son of a glass-painter who apprenticed him to the trade as soon as he was old enough to learn it. Some three decades later he settled at Saintes and there pursued his trade. One day, seeing a white enamelled cup of great beauty, he determined, as he stated, "like a man who gropes in the dark," to discover the secret of its manufacture. For sixteen years he experimented with all kinds and combinations of clay, enamel, paint, and furnaces, achieving only failure after failure until finally, as he wrote in his simple and interesting autobiography: "Wood having failed me, I was forced to burn the palings which maintained the boundaries of my garden, which being burnt also, I was forced to burn the tables and flooring of my house, to cause the melting of my

second composition. . . . I suffered anguish which I cannot speak of. . . . I was the object of mockery, and even those from whom solace was due ran crying through the town that I was burning my floors. I was regarded as a madman. I had nothing but reproaches from my family; in place of consolation they gave me maledictions. My neighbors said I was nothing but a fool."

BUT—he finally was successful, and Catherine de Medici was so pleased with his work that she appointed him "Inventor of Rustic Figures." Today Palissy's products are to be found in all great collections the world over.

MIGHT PROVE EMBARRASSING TO MIXED COMPANY

"Philadelphia Honors Work It Disapproved in 1800's," runs the heading of an article in *News Week*, March 13, 1937. In brief, the story is as follows:

William Rush (1756-1833) was the son of a ship carpenter who established himself as America's first successful sculptor, as well as a leading citizen of his native Pennsylvania. Concerning one of his pieces, "Water Nymph and Vixen," "an avalanche of disapproval fell on the beautiful belle, Nancy Vanuxem, who appears in the statue as a lithe nymph draped in diaphanous folds. . . . Modesty ran high in those days, and Rush himself had agreed to a decision of the newly founded Academy to set aside Monday 'with tender gallantry' for the ladies exclusively. The Greek sculpture, the founder thought, might prove embarrassing to mixed company."

BUT—despite a lack of early recognition, Rush finally won a reputation as a ship sculptor and then turned to sculptoring figures for public buildings—

busts of Washington, Lafayette, and other men of the day; later he made the first anatomical models to be used in this country. In 1805, with 70 of his townsmen, he founded the Pennsylvania Academy of Fine Arts.

And in March, 1937, the Philadelphia Museum of Fine Arts paid homage to his genius with a comprehensive show of every available work, finding records of 86 pieces but being able to locate only 37 for the exhibition. Thus "Philadelphia honored work it disapproved of in the 1800's."

ART AND MACHINERY DON'T MIX

A number of years ago a famous artist, distressed by the drab appearance of the interior of one of London's railway stations, suggested that painting large pictures on the walls would make them more attractive; and, at no cost to the company, he offered to do these murals. However, the company refused to consider his offer on the ground that "art has nothing to do with machinery."

XI

SPORTS AND RECREATIONS

FOOTBALL

Football, far from being a modern game, is one of our oldest. There is a record of a type of football played in Greece in 478 B.C., thus making this game more than 2400 years old. The game made its first appearance in western Europe during the fourteenth century. It is frequently reflected in the writings of Chaucer, Shakespeare, and other great literary men. The early colonists brought it with them to America, but the strict Puritan distaste for any kind of frivolity prevented it from being played. Ultimately, it became somewhat common in this country. The first intercollegiate game was played between Rutgers and Princeton on the campus at New Brunswick on November 16, 1869. There were twenty-five players on each side. No uniforms were as yet available, and so the players doffed their high hats, removed their coats, and tied their suspenders around their waists. Some of the reactions to this game, and to the innovations suggested during its development, will illustrate the attitudes taken towards this type of "foolishness."

A BLOODY AND MURDERING PRACTICE

One of early London's peace loving citizens described the game of football in these words: "For as concerning football playing, I protest it may rather be called a kind of fight than a play or recreation; a

bloody and murdering practice than a friendly sport or pastime."

KINGS POPULARIZED IT BY FORBIDDING IT

King Henry (1154-1189), and several other later monarchs banned football because they wanted the



Clear out, football ain't allowed.

boys to spend their time at archery—the national sport, something that they could use in case of war.

In 1314 King Edward III, in response to the protests of merchants who contended that they were forced to close their shops because of the football games in their streets, together with the dogs running up and down with the players, forbade the playing of football. It "endangered the lives of pedestrians." In those days there were few football fields, and the street provided a somewhat limited opportunity.

HEY, STOP!

Soccer, a kicking game, had for centuries been a popular sport in England. On the afternoon of a

certain day in 1823, during an interclass game of soccer, the ball bounded in front of one Willie Ellis. He was unable to kick it because it bounced almost into his arms, and so he caught it and, to the horror of his classmates, ran with it down the field and across the enemy's goal line. He was severely censured by both teams and officials for his "unsportsmanlike conduct" and removed from the game.

Later, some individuals, recognizing an interesting variation in the game, began to suggest that carrying the ball be made a definite part of it. For several years there was a violent controversy between the "kickers" and the "carriers," but the latter finally won their point. And today one can see the following inscription on a stone wall at Rugby, a memorial to the boy who really originated the "Rugby" game:

This stone
Commemorates the Exploit of
WILLIAM WEBB ELLIS
Who with a fine disregard for the rules of
Football as played in his time
First took the ball in his arms and ran with it
Thus originating the distinctive feature of

THE RUGBY GAME
A. D. 1823

MERELY TO AGITATE A BAG OF WIND

"I will not permit 30 men to travel 400 miles merely to agitate a bag of wind," said President White of Cornell University in 1873, when the University of Michigan challenged Cornell to a football game to be played at Cleveland, with 30 men on a side.—JOHN

MCCARTHY in *Scribner's Commentator*, November, 1938.

OF ILL REPUTE

Once introduced, football developed with amazing rapidity in college circles, and nearly all colleges laid out "fields" upon which it was to be played. Uniforms appeared and became instantly popular. However, there were relatively few rules, and by 1905 there had been many injuries and some deaths. At that time the game seemed so dangerous and became of such ill repute that many American schools banned it, and still others were considering doing so, even in the face of opposition from influential and publicity loving alumni. It was too rough. The rules committee met in 1905 and formulated the regulations designed to eliminate unnecessary roughness. And these new rules were labelled as "regulations that sissify the game."

ILLEGITIMATE OFFSPRING OF LEGAL FOOTBALL

The forward pass was used under the name "Harpaston" by the ancient Greeks. The lateral pass is almost as old as the original game of Rugby, but the modern forward pass is relatively young. This "illegitimate offspring of legal football," as one coach snorted, was made legal by the rules committee that met immediately after the season of 1905. It was looked upon by the coaches with distrust, and was so heavily handicapped by the rules that it was used but little for several years.

KEEP OUT OF THE SALOONS NEXT TIME

A Pennsylvania scout who went to watch the Carlyle Indians a week before they played his alma mater was one of the victims of the early debates about the

forward pass. The Indians, under Pop Warner, had learned to throw the pass with amazing accuracy for unbelievable distances. The scout returned with the information that the Indians could throw the ball farther than our great Bill Hollenback could kick it. The scout was reprimanded and told to keep out of the saloons on the next trip. . . . The following week the Pennsylvania secondary stood and watched while the ball sailed over their heads.—HARVEY J. HARMAN, "The Forward Pass of the Future," *The Journal of Health and Physical Education*, October, 1937.

A SUNDAY SCHOOL GAME

In 1934, Stephen Epler, coach of a small Nebraska school, invented a new football game—six-man football. "This game," said he, "will allow the smaller schools to have a football team; let every man pass and carry the ball, thus making it more interesting and more difficult; minimize injuries because rubber-soled shoes will be worn; permit no dangerous piling on; and be available for younger boys. It will be interesting, inexpensive and safe." The game looked good on paper, and in the explanations of Epler and some other enthusiasts, but it was slow in taking hold of the public's imagination, to which a football game meant 22 men and certain traditional practices. It was sneered at as a "Sunday School game," and "a game for girls," and the usual prophecy was that it would never become common.

BUT—once it was introduced, it swept through the country like wildfire, and it is now fast becoming an important part of the athletic schedule of smaller high schools and of the intramural athletic program of the larger. In addition, it is widely played on play-

grounds and at recreation centers by boys of all ages.

BASEBALL

Although we consider baseball an American game, the English maintain that it grew out of their earlier game of "rounders," which, incidentally, was termed a "sissy" recreation. However, we usually date our baseball from the time when two boys, Abner Doubleday and Alexander Cartright, were playing in a field at Cooperstown, New York. One boy would throw the ball and the other would try to hit it with a board. Presently Abner suggested that the batter try to run to "base" and back, and the other attempt to touch him with the ball before he got back to his batting position. Obviously, this was the original "one old cat," which later became "two old cat" when another base was added and more boys got into the game. This game was played by the soldiers during the Civil War. Following the war, Doubleday worked out the rules and had an engineer friend lay out a diamond with three bases sixty feet apart.

TWO STORIES OF THE "HOOK"

Billie Cummings is usually given credit for the baseball curve. As a young boy he had noted how thrown clam shells curved to the right or left, and to a lesser degree up and down, and that he could determine which way they would curve by the way he held and "skipped" them. One day he wondered why he could not make a ball curve in somewhat the same manner. Years later he said: "The mechanics of the on them if I could make the ball curve like the shells thing fascinated me. The kids of our town used to play two o' cat and I thought it would be a good joke

did. I began to experiment, and had a little success, but before I really got any place I was sent away to school. I continued to experiment, and they laughed at me for my crazy idea."

However, after some four years of experimenting, he developed his curve, and one day in a game against Harvard he was successful in baffling the opposing players—to such an extent, in fact, that the official was called upon to examine the ball and the pitcher's hands to see if he was really showing "good sportsmanship."—HAROLD C. BURR, *Revolutionists of Baseball*. *Baseball Magazine*, August, 1932.

A second, and less well known, story is that the curve was discovered and perfected by an Ohio farmer boy. One day, so the story runs, he did something to the ball that gave it a slight "hop." His catcher was as surprised as he was, and asked him how he did it. He did not know, but together they talked it over, experimented by holding the ball in various positions, and throwing it in various ways until they decided that the curve was caused by twisting the wrist. This point settled, the pitcher began in earnest to perfect his "crooked ball." Later the story got into the newspapers of how a boy could "throw a baseball crooked." Naturally, this story was laughed at as a "lot of bosh." However, it persisted, and finally a committee of three college professors—a mathematician, a physicist, and a biologist—journeyed out to the farm to investigate. The boy threw the "crooked ball" for them. They went back and reported that it was "merely a case of optical illusion; our eyes were deceiving us."

THE SISSY'S GOT A MITTEN!

Charlie White is popularly supposed to have worn

the first baseball glove in 1875, and, incidentally, he was severely razzed for wearing it.

However, there is a record of the use of the mitten even before this. In this old newspaper account a catcher who had a sore thumb due to a foul tip, thought that he would protect his thumb by wrapping a piece of cloth around it. He did so, and finding that he had a longer cloth than was necessary, wrapped the remainder around the palm of his hand, split it, and tied the ends. His own teammates knew that he had a sore thumb, but the opposing players didn't, and they shouted in derision all through the game—"The sissy's wearing a mitten." The catcher not only protected his thumb, but came to the conclusion that the mitten idea was sound. After the game he went home, got out a glove, and stitched some small strips of cloth on the inside of it. This was the first manufactured baseball glove.

Later the glove was donned by the first baseman and then by the other infielders, and still later by the outfielders—and each new adoption brought on a violent controversy and the often-repeated condemnation that "the game is deteriorating."

HE'S GOT A BIRD CAGE ON HIS HEAD

In an early day the catcher stood some distance behind the batter and caught the ball on the bounce. Later he moved up into his present position behind the plate in order to cut down base stealing. Naturally, being completely unprotected, he stopped many foul balls with his face, arms, and body; bruises, broken noses, black eyes and loose teeth were common among old-time catchers.

Harry Thayer of Harvard invented the catcher's


mask in the late 70's. His appearance on the diamond with his homemade "bird cage" was greeted with a roar of laughter. The patrons of the game thought he was merely clowning to make the game more interesting. However, when they learned that he was really serious, their inoffensive laughter changed to downright ridicule. And, as a result, many a catcher of the earlier days would not wear a "bird cage," preferring bruises and broken bones to scorn and ridicule.

A MODERN KNIGHT IN ARMOR

The introduction of the "chest-protector" followed the catcher's mask. Similarly, it was the target of ridicule, not only by the general public but by catchers themselves. These players disapproved of it because they held that "a good catcher does not get hit," and perhaps there was some truth in this because the old-fashioned catcher's glove was an enormous affair, much larger than that worn today. Too, catchers did not like the "protector" because it was of considerable size and bulk and interfered with free movement.

Then, some thirty years ago, came the "shin guards," protectors for the lower legs. And, as with the other innovations for the catcher's use, these guards were scoffed at.

The writer has in his files a photograph of the New York Giant catcher of about that time, all dressed up in his ponderous glove, the large, old-fashioned mask, the bulky wind bag, and the new "shin guards." The caption of this picture is, "A Modern Knight in Armor," and the first sentence of the story reads: "The modern knight requires more armor in which to play than did the old-time knight in which to fight."



SISSY TOMMY

On the old Atlantics team, of Brooklyn, was a little chap named Tommy Barlow. He swung a short light stick and couldn't hit the ball very far. He had noticed how the infielders all played back for a hard driven ball. So in one game he came innocently to bat, shortened his grip on the first pitch, and, instead of swinging, bunted the ball down the third base foul line. The pitcher and the third baseman were caught flatfooted, and Barlow sped triumphantly down to first. But the crowd would have none of his innovation. They hissed and booed and hung on Tommy the name of "sissy." He became discouraged at the ridicule and soon drifted out of baseball. But no ball club of the present would think of leaving the art of bunting out of its bag of tricks.—*Reader's Digest*, July, 1933.

SQUEEZE HIM

A number of years ago Clark Griffith, manager of the Highlanders—the present Yankees—was watching a man being advanced from second base to third by means of a sacrifice bunt. "Why not?" said he aloud to himself. "Why not what?" asked a player who sat next to him and overheard this bit of personal conversation. "Why not sacrifice a man from third to home? You can sacrifice him to second and third with a bunt, and if you got him home it would be a good investment, one run for one out." "S'pose the batter missed his bunt, or the baseman played for it and caught him at home," snorted the player. "Of course it wouldn't work all the time," mused Griffith, "but no other play does either." He scheduled practice in this new bit of baseball strategy and soon had it working fairly successfully.

Players were suspicious of it, as they had been earlier of the bunt. It required a good bunter, a good runner, and perhaps some luck. John McGraw called it "the biggest sucker play in baseball."

BUT—the Highlanders used it and won games with it. In those days a single run was an enormous advantage. Later other teams took it up. Although it is not used now as much as formerly, due to the introduction of the lively ball and the spectator-delighting fence-busting policy of the modern game, this bit of baseball foolishness is still used.

ANOTHER SISSY GAME

When the game of softball was first introduced, it was loudly jeered at—mostly because the ball was larger and softer than the regular baseball, and the diamond was smaller. Boys brought up on the hard ball refused to play this new game, referring to it as a "game for girls and sissies." Even one well-known sports writer, after having heard about it, said it looked to him "like a game for old ladies and cripples."

BUT—now every year in the United States some 2,000,000 regularly scheduled softball games are played by some 100,000 organized teams representing more than a million players. And, of course, there are other millions of players who play this "sissy game" under all sorts of informal conditions and in all sorts of unorganized settings. Further, this game has become popular with the girls as well as with the boys. And, incidentally, it is interesting to note that some of our big league baseball players have been "suckers" in the game of softball, one of the best known of them recently being struck out on three straight pitches by a softball unknown.

MY CLUB WILL NEVER PLAY UNDER LIGHTS

Three decades ago a sports writer brought himself some uncomplimentary publicity by suggesting the "fantastic dream" of playing baseball at night under powerful electric lights. Perhaps it was "fantastic." At least nothing was done about it until a little over ten years ago, when a minor league baseball team toured the country, playing its games at night. The club was equipped with a portable electric light plant and, after the fashion of the carnival, played one-night stands, meeting local teams. But even then this idea was branded an "impractical pipe dream."

Finally, one major league magnate decided to try out this piece of foolishness, and the result was that in 1935 the Cincinnati Reds, under a \$60,000 lighting system, played seven games that drew more than 120,000 spectators. The Brooklyn Dodgers then equipped their park and in seven games drew 178,000 fans. Normally, if played in the afternoon, the seven games of these two teams would have drawn about 35,000 people. The idea looked promising, but the other major league clubs were cautious. They did not take to it immediately; in fact, they were literally forced into it.

One of the best known of American baseball dignitaries vehemently stated, "The will never play under lights." But he was wrong; his team not only now plays at night in other baseball parks, but his own park has an expensive and modern lighting system and plays the allotted games under the lights.

ALL RIGHT, THEN WE'LL MAKE IT TEN-PINS

Bowling, one of our most popular indoor pastimes,

grew out of the old English outdoor game of "Lawne Bowls," which originated during the 13th century. However, even though popular in England, outdoor bowling was prohibited in several of the early American colonies because it was considered "frivolous." Even as late as 1850, "nine-pins," as it was called by this time, was illegal in the state of New York. But it was played despite occasional arrests and prosecutions. About 1875 a law-abiding enthusiast added another pin and arranged a new set-up, with the result that the new game of "ten-pins" was perfectly legal and aboveboard.

THEY'VE CUT 'EM IN TWO!

In the early motion pictures there were no close-ups; the films showed the actors full length, and, of course, all emotions by these players were shown by exaggerated and vigorous gestures. David Wark Griffith had an idea that emotions should be shown through the face, and because in the full-length pictures the faces were too small to show much, he introduced the close-up picture. Many of us can recall the hoots and shouts that went up when these first close-ups were shown on the screen. "They've cut 'em in two," was one very common reaction. "Where are their legs and feet?" was another, and more than one patron declared he was going to ask for a refund of his admission fee because the picture showed only a part of the actors and actresses.

And it was this same D. W. Griffith who led the way towards multiple-reel movies. The proprietors of the early Nickelodian, Nিকেlette, Nickeldome, and similar five-cent shows—which ran one 1000-foot picture—were certain that a ten-minute movie was all

that an audience would sit through. And they were aghast when Griffith announced his first two-reeler. In fact, they were so aghast that they suggested they be allowed to run it on two successive days, calling the first section, "Part One, The Trust," and the second, "Part Two, The Trust Fulfilled."—FRANK S. NUGENT in *The New York Times Magazine*, March, 1936.

WALT HAS GONE UTTERLY WACKY

When the news leaked out that Walt Disney (who had produced "shorts" which, in general, are not particularly profitable) was planning to produce his favorite childhood fantasy as a full-length feature, Hollywood thought Walt had gone utterly wacky.

BUT—"Snow White and the Seven Dwarfs" caused the second great revolution in the history of the movies (the first was sound in 1929). Without a single living actor or a "great name," not one real background or stage setting, no lighting and no labor troubles—nothing save imagination and brains and beauty and love set to music—this film is one of the most successful, if not the most successful ever made. And, so far, it has been sound-tracked in eight different languages.—MIRIAM STILLWELL, "Walt Disney's \$10,000,000 Surprise," *Liberty*, April 9, 1938.

FINED FOR FURIOUS DRIVING

The predecessor of the bicycle was the German-invented "hobby horse—a wheeled vehicle which the rider bestrides and forces along by dabbing the ground alternately with either foot." It was popular among men of wealth and leisure and soon became known as the "dandy horse." Then about 1840 a Scots-

man, Kirkpatrick MacMillan of Dumfries, designed a two-wheeled vehicle which could be propelled by pedals—the bicycle. While trying out his new



Just a minute, buddy!

device in the streets of his own home town, he was arrested, prosecuted, and fined for "furious driving."

Today there are some 4,000,000 bicyclists in the United States. The modern developments are amazing—three-speed gearshifts, automobile type steering wheels, rubber cushioned seats, balloon tires, head and tail lights, bicycles carrying up to ten riders, and even a collapsible trailer.

There are hundreds of cycling clubs, special bicycle paths and trails in the parks of great cities, bicycle tours without number, bicycle races, and bicycle polo games. The bicycle is now licensed in more than 400 American cities. It has been estimated that more than 10,000,000 bicycles have been manufactured and sold in the United States.

LASCIVIOUS ORGIES OR HEAVY WITH UNLEASHED PASSIONS

Thirty years ago social dancing was limited largely to the waltz and the one-step—a sort of clumsy wrest-

ling match. Vernon and Irene Castle, an American dance team appearing in Paris, intelligently worked out graceful and easy-to-learn variations, became a hit, and returned in triumph to their own country, where they continued their developments—and successes. The Hesitation, Tango, Lamé Duck, and Fox Trot became common. And afternoon dansants, dancing between dinner courses and after the theater, became all the rage.

As might be expected, opposition was immediate, furious, and incessant. Public officials denounced the “lascivious orgies going on in so-called respectable dance halls.” William Inglis reported in *Harper's* that drunken sailors cavorting did not compare with what he had seen in dansants in popular restaurants. Another writer said that “the very air of these places is heavy with unleashed passions.”

Fifteen young women employed at The Curtis Publishing Company were dismissed after they were discovered turkey-trotting during the lunch hour. The tango was barred at the Yale Junior Prom in 1914; in a New York suburb an 18-year-old girl was arraigned in court for disorderly conduct, which consisted of dancing the turkey-trot; for the same offense a New Jersey girl actually got a sentence of \$25 or 50 days in jail.

BUT—dancing became a popular form of diversion for both young and old, and it became respectable by getting into all types of educational and other highly regarded institutions. In addition to this, it brought in simpler and less constricting fashions in women's clothes, and was to some extent responsible for bobbed hair, cosmetics, and the more modern styles.

And certainly, it brought in a more informal, healthy and happy relationship between the two sexes. It has contributed very substantially to wholesome social development.—From FREDERICK LEWIS ALLEN, "When America Learned to Dance," *Scribner's*, September, 1937.

HE HELPED THEM PLAY

In 1894, Joseph Lee, whose father was senior partner in Lee, Higginson & Company, and one of Boston's "first citizens," was shocked by reading a newspaper account of the arrest of some boys for playing baseball in the street. So this lawyer-banker began to study play. He soon arrived at his theory that "play is synonymous with growth," and began to campaign in a very practical way for healthful recreation. He cleaned out a vacant lot in one of Boston's tough districts, provided equipment, and then invited the children in to play. To his utter amazement, he discovered that the children simply did not know how to play. So he began a second campaign for competent and trained playground leaders and supervisors.

But Lee met with stiff opposition. Legislators and philanthropists believed it foolish "to lead children in play;" educational and religious organizations were jealous and suspicious; and even social and welfare workers ridiculed Lee's "play-philosophy" and his efforts. However, in spite of difficulties and discouragements, Lee persisted.

AND—public playgrounds, social and athletic leagues and clubs, juvenile courts, and health supervision in schools—not only in Boston, but in other cities—began to appear. The National Recreation

Association, with its great program of national and international assistance and promotion, was another important outcome of Joseph Lee's interest in play. Now some \$75,000,000 is spent annually in America for free recreation activities.

XII

WOMEN'S ACTIVITIES

Not so many years ago a woman was considered a mere chattel, with no more rights than an ox or a horse. And, like any other piece of merchandise, she could be sold, rented, or given away. Even in Roman times she could, for certain actions, be killed by her husband. Naturally, her fight for recognition and freedom has been against the overwhelming odds of hidebound tradition. But, due to the struggles of the "fools" of her own sex, and to the "foolishness" of those of the other, she is coming into her own. A few illustrations of the early attitudes will serve as a background for the following discussion of foolish women and their foolishness.

SILENCE BECOMING TO MARRIED WOMEN

Phidias supported the statue of Aphrodite at Elis upon a tortoise to signify the protection necessary for maidens and the homemaking silence that is becoming to married women.—From PLUTARCH'S "Concerning Isis and Osiris."

SHE'S A PLAGUE

Rousseau, in his famous book, "Emile," devotes four "books" to a detailed description of the proper education of boys through the medium of an ideal teacher. He devotes the fifth "book" to the education of Sophia, who was to be the future wife of Emile. Her education was to be immensely practical. That Rousseau did not believe in a more general or a more

liberal education of women is shown by this sentence from the fifth book: "A woman of culture is the plague of her husband, her family, her servants—everybody."

I ALLOW WOMEN TO LEARN OR TEACH? NEVER!

Giordano Bruno, the great Italian philosopher, was a "fool" in his own right; he rejected the Aristotelian astronomy for that of Copernicus, developed a more logical theory of religion, and made several other important contributions. In fact, he was such a successful "fool" that in 1593 he was imprisoned and in 1600, after seven years in prison, was burned at the stake. However, on the little matter of the education of women, the great Bruno had this to say, "I allow women to learn, to teach? Never!"

EDUCATE SHE'S? NEVER!

When public schools were being organized in the early colonies, the question of the education of girls arose naturally enough. Such education was practically unheard of, and it was a bold individual who argued "that two hours, or a part of that time, be devoted to the instruction of females, as they are a tender and interesting branch of the community, and have been much neglected by the public schools of the town." Finally, one New England village voted that a committee might arrange with the schoolmaster "to instruct girls two hours in a day after the boys are dismissed."

This brought the matter to a head, but not all communities favored it. The Committee at Northampton, Massachusetts, in 1788 voted "Not to be at any expense for schooling girls," and Haverhill also rejected

it. There is a record of this exclamation of one Haverhill citizen—"Haverhill educate she's? Never."

It was commonly believed, even by teachers and other professional educators, that certain subjects, especially Latin and geometry, were "beyond the grasp of weak female intelligence and above their powers."

SEDUCING STRICTLY FORBIDDEN

In the Year of Grace, 1700, Parliament enacted this tasty bit of legislation: "That all women of whatever age, rank, profession, or degree, whether virgin, maid, or widow, that shall from and after such Act impose upon, seduce, and betray into matrimony any of His Majesty's subjects by means of scent, paints, cosmetic washes, artificial teeth, false hair, Spanish wool, iron stays, hoops, high-heeled shoes, or bolstered hips, shall incur the penalty of the law now in force against witchcraft and like misdemeanours, and that marriage upon conviction shall stand null and void."—*House and Garden*.

SHAME IS CAST ASIDE

Alas, how miserable . . . maidenly modesty and honor have fallen off and the mother's guardianship has decayed both in appearance and in fact, so that in all their behavior nothing can be noted but unseemly mirth wherein are no sounds but of jest, with winking eyes and babbling tongues and wanton gait and most ridiculous manners. The quality of their garments is so unlike to that frugality of the past that in the widening of their sleeves, the tightening of their bodices, their shoes of Cordovan morocco with twisted beaks, nay in their whole person, we may see how shame is cast aside.—GUILBERT DE NOGENT, 1115 A. D.



THE LAW VERY WISELY GIVES THEM LITTLE

Nature has given women so much power that the law very wisely gives them little.—DR. SAMUEL JOHNSON.

LADIES, DON'T CROSS YOUR LEGS

In the days of the Puritans, the women, on those rare occasions when they were allowed to sit in male company, were required to sit with both feet flat on the floor. Ladies who crossed their legs were considered immodest.

VASSAR'S FOLLY

Matthew Vassar, an Englishman who had had little schooling but who had educated himself, was a prosperous brewer of Poughkeepsie. He had a "crazy idea" that women should have educational opportunities somewhat similar to those which the men enjoyed at Yale and Harvard. In keeping with his conviction, in 1865 he launched Vassar College, the world's first endowed college for women, with a magnificent gift of \$788,000 and 200 acres of land. This was considered foolishness of the first rank. Poughkeepsie's favorite jibe at the college was "Vassar's Folly."

THE FIRST FOUR CO-EDS

"The elevation of the female character, by bringing within the reach of the misjudged and neglected sex all the instructive privileges which have hitherto unreasonably distinguished the leading sex from theirs"—this was one of the announced objectives (and startling it was) of the founder of Oberlin College. So, when opened in 1833, this revolutionary institution consisted of four men's departments and one "female" department.

Four girls entered Oberlin in this year; three of them were graduated in 1837. Discipline was, naturally enough, very strict. The girls were forbidden to use tea, coffee, and spices, and when later the college was given a telescope and the girls asked to be allowed to look through it, the lady principal was "hesitant about allowing the girls to sit up to view heavenly bodies." In 1839 it was proposed that men and women should be allowed to attend the same classes in composition, but this idea was rejected. The first extra-curricular activity was the "Oberlin Female Moral Reform Society."

In 1937 a monumental gateway and amphitheater was dedicated in honor of these first co-eds who "passed into history at the head of a procession of millions of other sisters who have since forced long-barred university gates in almost every community of the globe."

THE LORD HEARD OUR GROANS AND FREED US

Anne Hutchinson, revolting at the narrow and bigotted Puritanism of her day, and also at the exclusion of the women from many of the religious meetings of her community, organized weekly meetings for the women. Her words and actions were considered outrageous, and she was haled before the General Court of Massachusetts, which heard the case and then pronounced her guilty of "unwomanly, heretical, and slanderous words and actions." A bit later she was exiled by Governor Wolcott and excommunicated by Cotton Mather. With her six children Anne settled in New Netherlands, where shortly thereafter she and five of the children were killed in an Indian raid.

When the story of this raid was told by Anne's eight-year-old daughter, who had been returned to Massachusetts by the Dutch Colony, the clergy and other religious-minded folks of the colony "fairly rejoiced over the tragedy as proof of Anne's guilt." And Welde, one of the ministers, said, "The Lord heard our groans to Heaven and freed us from our great and sore affliction."

However, Anne Hutchinson was successful in beginning the three-century struggle for freedom from clerical tyranny and woman-suppressing traditions.

WHAT, NO MORE CHILDREN?

Three of the most unpopular social movements in the United States took advantage of the Fair crowds (America's first World Fair, at New York in 1853) by staging their conventions in September. There were two temperance conventions, an Anti-Slavery con-



Who'll have the babies, and do the cooking?

vention, and a Woman's Rights convention. To circumspect citizens, the latter, especially, seemed dangerous and crazy.

A woman speaking from a public platform was unnatural; it boded no good, many thought. Editors seized their quills. Greeley of the *Tribune* and William Cullen Bryant of the *Post* defended the women. The *Times* and the *Herald* thundered against "unsexed females." If they should prevail, who would cook the meals? Were there to be no more children? Meetings packed by thousands were invaded by organized rowdies who shouted the speakers down. Lucy Stone, Lucretia Mott, Susan B. Anthony, glowing with ardor and youth, made their scheduled speeches, but scarcely a word of them was heard.—ALICE MARY KIMBALL and WANDA WELLNER, "America's First World Fair," *Cue*, March 11, 18, 1939.

DESTROY THE GERMS

Lucretia Mott and Elizabeth Cady Stanton had organized a convention for women's rights as early as 1848—the first, according to one authority (A. M. Schlesinger, "New Viewpoints in American History," p. 138, The Macmillan Company, 1932) in the history of the world. A riot gathered around the building where they met, and the building was burned after the meeting "to destroy the germs of this new disease."—ROGER BURLINGAME, "March of the Iron Men" p. 377, Charles Scribner's Sons, 1940.

BUT—in 1868 a bill for women's suffrage was introduced in Congress. Such a bill was passed by the Wyoming state legislature in 1869 and by the Utah legislature in 1870. The League of Women Voters reported (1940) that in the November elections, 140



women were elected to the legislatures of 29 states—ten more than two years before but nine below the peak of 1929. Incidentally, 76 of these 140 were Republicans, 61 were Democrats, and three were Independents. More than half of them were elected in the New England states.

HAS MY DAUGHTER LOST HER MIND?

On July 19, 1848, the first Women's Rights Convention was held in Seneca Falls, New York. Its leading spirits were Mrs. Stanton and Lucretia Mott, but about them were gathered an earnest body of thinking men and women whose names we identify with the anti-slavery cause rather than with women's rights. There was a chorus of sneers and snarls from the press. Mrs. Stanton said afterwards that with all her courage, had she had any premonition of the storm of ridicule and denunciation which greeted their meeting, she would never have dared to brave it. Her own father, on reading the demand of the meeting for woman suffrage, rushed down to Seneca Falls to see if his daughter had lost her mind.—W. J. ABBOT, "Women of History," p. 277, The John C. Winston Company, 1913.

A DISGUSTING AND UNWOMANLY CREATURE

In 1792 Mary Wollstonecraft published the classic of the equal-rights-for-women movement—"Vindication of the Rights of Women." The revolutionary theories of this great book shocked the Puritans of both England and America, and these agreed wholeheartedly with Horace Walpole, the famous English politician and man of letters who characterized her as "a disgusting and unwomanly creature."

A HEN WILL CROW LIKE A COCK

When Lucy Stone's father, Francis Stone, was told

by one of the other members of his family that Lucy wanted to go to college as her brother had done, he kicked over a chair and shouted, "Is the girl crazy?"

But in spite of handicapping and humiliating circumstances, Lucy went to Oberlin—the only college in America that was open to women (and Negroes). Being an excellent student, she made a fine academic record and was asked to write an essay for the commencement program. However, because no women were allowed on the platform, she was not allowed to read it. One of her professors volunteered to read it for her but she refused.

Following graduation, Lucy went back to Massachusetts and made many addresses on "Woman's Rights." Later she became a full-time speaker for the Anti-Slavery Society. Naturally, she faced a great deal of opposition. At Malden a minister who had been asked to announce one of her meetings did so in this manner—"I am asked to give notice that a hen will attempt to crow like a cock in the town hall at five o'clock tomorrow evening. Those who like such music will, of course, attend."

When Lucy was married in 1855 she shocked the country by insisting that the word "obey" be eliminated from the marriage ceremony. Women as well as men joined in condemning this "unwomanly effrontery."

THE MEWING CATS

England considered her a public enemy and tried to keep her in prison; America read of her antics and laughed. But Emmeline Pankhurst, the militant martyr who fought the now-forgotten fight

for Woman Suffrage in the 1900's, was neither dangerous nor ridiculous. . . Lloyd George told his listeners when women questioned him, to "pay no attention to the mewling of those cats." . . . Arrested and thrown into jail almost times without number, she stuck to her guns.

In 1917 Parliament acquiesced. In February, 1918, the Royal Assent was granted, and all English women over 30 could vote. . . . A few years later the "Flapper Vote" extended the ballot to girls not actually minors.

Today her statue, like Oliver Cromwell's, stands where the Houses of Parliament can see it.—DONALD CULROSS PEATTIE, *The Washington Post*, November 6, 1938.

FOLLOW ME TO THE MOTTS

In 1818, at the age of 25, Lucretia Mott was ordained a preacher by the Society of Friends. Her main duty was to explain the moral code and the dogmas of her church, but she found plenty of places to insert preachments against slavery and intemperance, much to the disgust of her colleagues and fellow church members who objected to the "lugging in" of these extraneous topics. When she persisted, they even made an unsuccessful attempt to deprive her of her "minute," or letter of introduction, which she took from one meeting to another.

Years later, this modest self-effacing little woman told of many almost providential escapes from violence. Perhaps the best known of these is this:

In 1838 the Anti-Slavery Convention of American Women, in which Mrs. Mott was a diligent leader, held its meeting in the Pennsylvania Hall in Philadelphia,

a hall which had been dedicated to the "Liberty and the Rights of man." While the meeting was in session a mob packed the surrounding streets, smashed the windows, hooted, and yelled threats. A few hours after the meeting the mob burned the Hall. Tiring of the sight, the mob marched off towards the Mott home with the intention of similarly destroying it. However, the rioters were diverted from their course by a young man who mixed with them and, crying "Follow me to the Motts," led them off on the wrong streets, and in confusion the mob broke up.

LADY WITH THE LAMP—A DANGEROUS INNOVATOR

For centuries women have acted as nurses, but until very recently, with the exception of members of religious orders, they were not trained for their duties. And, of course, hospitals were "dismal Hell-holes."

Florence Nightingale, personable and cultured, decided to study nursing—much to the disgust of her family and friends. Later, during the Crimean War, as head of a group of 39 nurses, she was sent to Scutari to care for some 4000 sick and wounded soldiers who were jammed into an old barracks built for one-fourth the number. Board beds, no bed clothes, no supplies, no laundry, and no night service were a few of the discouraging elements of the situation she faced.

But she went to work vigorously, and in spite of hampering traditions, military red-tape, and a commissariat who considered her "a dangerous innovator," she cleaned up, organized, and equipped the hospital, much to the amazement of the army officers.

Given increased authority, she soon had more than 10,000 cases under her supervision. Her work was so successful that returning soldiers told and retold the story of "The Lady with the Lamp."

AND—a few years later, Henri Dunant, undoubtedly influenced by Florence Nightingale's work, began the "foolish" movement which ultimately resulted in the Red Cross.

"MR. CHAIRMAN"

In 1853 Susan B. Anthony attended an educational convention at Rochester. After listening for hours to a discussion of teaching, and particularly on the subject of why this profession did not command the respect accorded ministry, law, medicine and engineering, Miss Anthony suddenly arose and addressed the chair. The effect of this amazing action is recorded in Ida Husted Harper's "History of Woman Suffrage" (National American Women Suffrage Association, 1922) as follows:

"If all the witches that had been drowned, burned, and hung in the Old World and in the New had suddenly appeared on the platform, threatening vengeance for their wrongs, the officers of that convention could not have been thrown into greater consternation. Here stood a Quaker girl, calm and self-possessed, while the meeting was thrown into a panic. Half an hour was given to deciding whether or not she should be allowed to speak. There were 350 women and 500 men present. Only men voted. The women themselves, a large majority of them, if they had been allowed to vote, would have voted 'No.' Finally, after much bickering she was allowed to speak—by only a small majority. Many of the women present felt outraged by this per-

mission. Miss Anthony spoke only a half dozen sentences and sat down, scorned by half of the men and nearly all of the women present."

I HEREBY FINE YOU \$100

In 1872 Susan B. Anthony attempted to vote in a regular election in Rochester, and was immediately arrested and brought to trial before an Associate Justice of the United States Supreme Court. This Justice discharged the jury, listened to the evidence, pronounced her guilty, and fined her \$100. Following her conviction, Miss Anthony addressed the Court, "Resistance to tyranny is obedience to God, and I shall never pay a penny of this unjust claim." And she never did.

SHE SHOULD BE LOCKED UP WITH THEM

Miss Dorothea Lynde Dix was a teacher in the public schools of Boston. She was a kindly sympathetic person and spent much of her free time in giving religious instruction to the inmates of the various institutions for unfortunates in her city. On March 28, 1841, she went to the East Cambridge House of Correction to teach a Sunday School lesson. Shocked by the conditions of the place and by the treatment of the inmates, she immediately resolved to attempt to improve them.

Up until comparatively recently in America, the insane, as well as law-violators, were locked up, chained, and treated with great brutality. The "best" of them were "farmed out" on bids to those who would care for them, while others were "run out of town" to become the plague of other communities. In America, as well as in Europe, an insane person was con-

sidered a sort of beast, not a human being. And naturally, the brutal treatment insane persons received only aggravated their condition.

During the next two years Miss Dix visited every jail and poorhouse in Massachusetts and then appealed to the state legislature. She wanted the insane separated from the criminals, with special institutions for the former and improved conditions for the latter. As might be expected, she was met with opposition and ridicule, part of which was due to the inertia of public opinion, and part to the commonly expressed opinion, "public affairs is no place for a woman." One critical newspaper even suggested that "she's crazy, too, and should be locked up with them."

But the kindly, simple-hearted Miss Dix was also a fighter and she persisted in spite of discouragements. Finally, she was successful, and the legislature appropriated funds for hospitals for the insane. Then Miss Dix carried her campaign into other states, meeting with the same kind of unintelligent and biased opposition, perhaps even more bitter because she was not a resident of these other states; she was an "out-of-state campaigner." But she continued her uphill fight.

AND—she was directly responsible for the establishment of thirty-two new state-supported institutions for the mentally ill, and at least as important, she was also largely responsible for the change in public opinion toward the insane.

DON'T WEAR YOUR HOOPSKIRTS, LADIES

After Handel had composed (in 21 days) his greatest work, "The Messiah," which he dedicated to

the Irish people, he was asked to present it in Dublin. This he planned to do, and in preparation for the great event, a day of celebration was declared. All shops were closed, and even the debtors' prisons were opened, so that everyone might attend. The only restriction was that the ladies who expected to attend were urged not to wear their hoopskirts, obviously, so that a large crowd could be accommodated. A newspaper in reporting this event, one of the greatest in Handel's life, stated, "The music was wonderful, but the appearance of the ladies without their complete clothing was shameful."

FOLLOW THE CANNON

Following the Civil War, Clara Barton, an angel of mercy whose motto was "follow the cannon," went to Europe to learn about the International Red Cross, which had been authorized at Geneva in 1864 by the representatives of 26 governments—China, Mexico, and the United States alone among the civilized nations being unrepresented.

While Miss Barton was there, the Franco-Prussian War broke out, and she immediately went to work again on the battlefields and in the hospitals. After being honored and decorated in Europe, she returned to the United States and began the long and bitter struggle for the organization and recognition of an American Red Cross. Opposition came from military, political, educational, and even religious bodies and organizations. But she fought on and finally, in 1881, the American Red Cross became a reality; and 60-year-old Clara Barton became its first president. And for years thereafter, wherever there were floods, forest fires, hurricanes, and other disasters, Clara

Barton went. Excluding royalty, she was more decorated than any other woman in history.

IT IS INDECENT

When the Female Medical College of Pennsylvania (now the Women's Medical College of Pennsylvania) was created in 1850, it was held indecent for a woman to be a doctor. Few medical men would risk their reputations by associating themselves with this new institution, and professional journals refused to publish its advertisements. Seven women, scorned and ridiculed, entered as the first class.

Later, women doctors were accepted somewhat, but only in the care and treatment of diseases and injuries of children—plus a few men “who went out of curiosity.” Druggists were loath to fill their prescriptions, as Hannah Longshore and other early women doctors complained.

BUT—the Female Medical College persisted, improved its faculty, equipment and curriculum (it was one of the first medical colleges to require a four-year course), and just recently celebrated its ninetieth birthday. And during these ninety years more than 2,000 qualified physicians were graduated.

A FORBIDDEN EXPRESSION

Margaret Sanger, sixth of eleven children, wanted to become a doctor, but when her mother died, worn out by child bearing, she took over the home. Later, seeing the doctor possibility out of the question, she took to nursing, specializing in obstetrics.

Often called on cases in the slums where cheap and death-dealing abortions flourished, she easily recognized the difference between patients who had children

at reasonable periods or intervals and those who had them close together. She knew nothing about contraceptives, but she knew that something should be done. Unable to obtain information on contraception from American doctors, she went to Europe and studied there.

Returning to America, she began her campaign of education. She founded The American Birth Control League and became its first president. Then she took a trip across the continent and encountered all sorts of difficulty: halls were closed to her; smug organizations and politicians attacked her; she was jailed in Portland. But by the time she was back in New York, birth control leagues had been founded in nearly every city where she had been.

Upon her return to New York, she opened the first birth control clinic in Brooklyn and in less than a month had given help to 480 women. Again she was arrested. She was convicted but appealed. In 1918 the Court of Appeals affirmed the verdict of the lower court, but also gave a broader interpretation of the law—and this represented success.

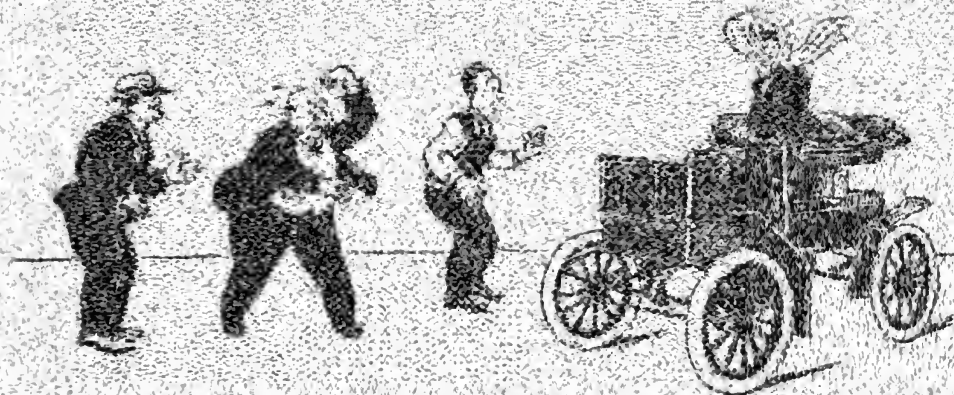
AND—today (1943) only two states (Massachusetts and Connecticut) have laws definitely construed by court decision as forbidding physicians to give patients contraceptives or contraceptive advice; 806 clinics in the United States give “baby-spacing” service; three state health departments and scores of county and city public health agencies include this as a part of their regular work; and countless thousands of physicians, no longer faced with arrest for violating the law, are helping to build a stronger America through “spaced babies.”

QUEEN VICTORIA SETTLED IT

When James Simpson discovered the use of chloroform as an anæsthetic, he immediately started using it to allay the pangs of childbirth. The Church was profoundly shocked at this, declaring that women had been ordained by God to bring forth children in sorrow as punishment for Eve's transgression. Simpson carried his fight into the enemy territory by pointing out that God Himself, before performing the first operation, namely, making Eve out of a rib of Adam, threw Adam into a profound slumber. Attack and counter attack followed. Everyone took sides. Then Queen Victoria announced she was going to have chloroform for her next baby; and suddenly all was still. The Queen had spoken. Simpson and chloroform had won.—JAMES HARPOLE in *Nash's*.

NOT PHYSICALLY FIT TO DRIVE

The Mayor of Cincinnati declared to the city council in 1906 that the driving of an automobile requires



She ain't physically fit to drive!

such qualifications that no woman is physically fit to undertake the task.—*Reader's Digest*, October, 1937.

AN IRRELIGIOUS AND IMMORAL PRACTICE

Up until comparatively recently there was a blind and unreasonable prejudice against women in clerical positions in offices, banks, and other similar business institutions. One of the men who defied this prejudice was General Francis Elias Skinner, who was appointed Treasurer of the United States by President Lincoln on March 16, 1861, and continued to hold this office until June 30, 1875. At this time many of the clerks in the government offices had gone to war, and General Skinner conceived the idea of employing women clerks—a startling innovation. He employed several hundred women.

Needless to state, this innovation brought censure from all parts of the country. The clergy called it “an irreligious and immoral practice;” labor groups opposed it because “it is crowding out the bread-winners”; and even women’s organizations evaluated it as “degrading and undignified.”

NOW—on the pedestal of the statue of General Skinner at Herkimer, New York—erected by the women of the Departments of the Government—are the General’s own words, “The fact that I was instrumental in introducing women to employment in the offices of the Government gave me more real satisfaction than all the other deeds of my life.”

I’LL CUT YOUR PAY

By the time she was only 20, Louisa May Alcott was writing about a dozen stories a month, most of which were published in the *Boston Evening Gazette*. Because she knew the traditional prejudice against women writers, she wrote all of these anonymously.

Later, her publisher, upon discovering that this very popular writer was "only a young woman," told her that he would have to reduce her pay. However, Louisa May objected vigorously, and the newspaper man, appreciating the quality of her work, repented.

FIRE ALL THE FEMALES!

On one of his rare visits to the offices of his famous *New York Herald*, the elder James Gordon Bennett saw a few hapless women sitting about the city room. Instantly he demanded, "Who are these females?" Upon being told that they were employees of his newspaper, Bennett shouted, "Fire them all!" Even today with some 12,000 women editors, feature writers and reporters in this country, the prejudice against women in the city room is strong.—ISHBEL ROSS, "Ladies of the Press," Harper and Brothers, 1936.

XIII

MISCELLANEOUS FOOLISHNESS

AN AFFRONT TO AMERICAN WOMANHOOD

Bernarr Macfadden dared to say that the human body was beautiful and should be displayed; when he exhibited girls in tights at Madison Square Garden, Anthony Comstock had him arrested. He argued for frequent fasting, for simple and healthful diets. He exhorted his country to get rid of patent medicines. He demanded the abolition of the corset, and his ungentlemanly ridicule of it was called an affront to American Womanhood.—FULTON OURSLER, "Bernarr Macfadden's True Story," *Reader's Digest*, September, 1937.

A PERILOUS THING TO BE AN INVENTOR

In ancient times it was a perilous thing to be an inventor; the man who could perform a scientific or mechanical feat which was beyond the knowledge of his neighbors was regarded as dangerous. It is related of one of the Roman Emperors, that on a certain occasion when a subject exhibited to the Court a large crystal vase which would not break when dashed to the ground, the monarch came to the conclusion that such a person was too clever to be at large, and had the poor wretch led off to execution. Alex of Provence fared no better in the seventeenth century. He invented an automaton skeleton, placed it in his window, with a guitar in its hand, and set it playing, so that it could be seen and heard by all who passed. It was at

once condemned as an instrument of magic and witchcraft, and poor Alex and his invention were burned together, by command of Parliament. The elder Droz, for making an automaton writing-boy, was seized upon by the officers of the Spanish Inquisition, and but just escaped with his life.—JAMES BURNLEY, "The Romance of Invention," p. 30, Cassell & Company, 1886.

THE HOT SEAT

"A most fearsome-looking piece of furniture," so it was called; a stout oak chair fitted with electrodes, a metal cap, and pinioning straps—the first electric chair, designed by Edwin F. Davis, an electrician. It claimed its first victim on August 6, 1890.

The following day the newspapers of the nation raged against the "unnecessary brutality of this most barbarous invention." Clergymen preached against it; signed petitions poured in by the dozens; and the inventor himself received hundreds of abusive letters.

Now, fifty years later, electrocution is the official form of capital punishment in 22 states.

X-RAY-PROOF CLOTHES FOR MODEST LADIES

When the news of the invention of the marvelous device which would "see through things"—the X-ray—got around, there was an indignant protest from women throughout the world. It was their belief, apparently, that, armed with this diabolical device, men would be able to see right through their clothes. Noting this reaction, an enterprising English merchant promptly advertised "X-Ray-Proof Clothes for Modest Ladies." And to forestall any too-intimate curiosity, a member of the New Jersey legislature

introduced a bill prohibiting the use of X-rays in opera glasses.—*Reader's Digest*, May, 1935.



Now we ladies will be safe.

WEREN'T CONSIDERED GREAT IN THOSE DAYS

George Washington was burned in effigy while he was President of the United States. Abraham Lincoln was called a clown and a gorilla by Stanton, whom Lincoln made his Secretary of War. Further, Lincoln, while President, was pilloried in effigy and scurrilously attacked in every state of the Union, both North and South.

THAT OLD VILLAIN, GENERAL SAM HOUSTON

"There he stood," wrote a man who was present, "an old man of sixty-eight years, on the balcony ten feet above the heads of the thousands assembled to hear him, where every eye could scan his magnificent form, six feet and three inches high, straight as an arrow, with deep-set and penetrating eyes."

The mob was silent.

"Some of you will laugh to scorn the idea of bloodshed as a result of the secession," said Sam Houston, "but let me tell you what is coming. Your fathers and your husbands, your sons and your brothers, will be herded at the point of the bayonet. You may, after the sacrifice of countless millions of treasure and thousands of lives, as a bare possibility, win Southern independence, but I doubt it. I tell you that, while I believe with you in the doctrine of state's rights, the North is determined to preserve the Union, and what I fear is, they will overwhelm the South."

Of course, no one present believed him. One southern orator said that he would wipe up with a lady's handkerchief every drop of blood that the North would spill in the defense of the Union.

Texas voted three to one to secede. At noon on March 16, 1861, the state officials were ordered to appear at the Capitol and take the oath of allegiance to the Confederacy before the Convention. Governor Sam Houston did not appear, and Lieutenant Governor Clark took the oath and was declared Governor of Texas.

Sam Houston was called everything that could be imagined, and later one newspaper stated "As for that old villain, General Sam Houston, the so-called 'Hero of Texas,' he has sunk out of sight, leaving scarcely a ripple on the surface."

BUT—Sam Houston was right; he was a good prophet.—BESSIE ROWLAND JAMES and MARQUIS ADAMS, "Six Feet Six; The Heroic Story of Sam Houston," The Bobbs-Merrill Company, 1931.

LOTS OF FEET IN CHINA

An attempt by leading silk merchants in Foochow

to adopt a standard lineal measure failed because most of the merchants refused to use it, and there remain in China several kinds of units of lineal measure—the Shanghai foot, the tailor's foot, the carpenter's foot, and the engineering foot—all of different length.—“Technological Trends and National Policy,” p. 48, The National Resources Committee, Washington, D. C., June, 1937.

JEFFERSON'S LOST CLAUSE

The Declaration of Independence displayed in a glass case in the Library of Congress is not Jefferson's original copy. The original sheets, which have been seen by only a few hundred Americans, are kept in a safe, and they contain a clause, omitted from the later copy, which is one of the most important in history. In it Jefferson denounces the King and the British Government concerning slavery and the slave trade. The clause was knocked out by pressure groups, specifically at the request of the delegates from South Carolina and Georgia.

It is futile to speak of what might have been, but there is no doubt that our country's whole course would have been different if this clause denouncing the slave trade had been allowed to stand. It would have led to the abolition of slavery at that time, and the tragic cost in blood and money of the Civil War, with its aftermath of twisted ideas, would have been prevented.—MAURY MAVERICK, “A Maverick American,” Covici-Friede, 1937.

GENTLEMEN, I DO NOT TRUST YOU

From its birth, the Constitution of the United States had many American enemies. One of the most

vitriolic of these was Bedford from Delaware who accused the Constitution builders of "ambition," and among other things said, "Gentlemen, I do not trust you." He further suggested that "there are foreign powers who would take us by the hand and help us."

A PAGAN CUSTOM

For centuries and centuries before the rise of Christianity to world influence, cremation was the general practice in a great many parts of the world, both "civilized" and "uncivilized." Christian leaders refused to accept this "pagan custom," and it gradually disappeared until about 1870, when the quick-burning process was developed by an Italian. The first crematory in America was established at Washington, Pennsylvania in 1876. In 1885 occurred the first cremation in New York. Interest developed rapidly, and by 1888 there were eleven crematories in the United States.

But as this practice developed, so also did the opposition to it. Nearly all of this opposition came from religious organizations which used such arguments as, "It is repugnant to the pious sentiments of the faithful"; "the body is the sacred temple of the Holy Ghost"; "it is too suggestive of a complete end"; and "it is not consistent with the idea of the resurrection of the body."

However, the practice of cremation has continued to develop with surprising rapidity until now there are nearly 200 crematories in the United States alone.

THE CEASELESS ACTION OF GRAVITY

On the 7th of June, 1776, Richard Henry Lee, at the state-house in Philadelphia, introduced the reso-

lution declaring, "That the United Colonies are, and ought to be, free and independent States, and that their political connection with Great Britain is, and ought to be, dissolved."

Upon this resolution there sprang up at once an earnest and powerful debate. Some of the best and strongest advocates of colonial rights spoke against the motion, which at last was adopted by a vote of only seven states in its favor to six against.

On the 11th of June, a committee was appointed to draft a formal Declaration; this committee consisted of Benjamin Franklin, John Adams, Thomas Jefferson, Roger Sherman and Robert R. Livingston. On the 28th of June the committee made its report and presented the Declaration which it had drawn up. It was so powerfully opposed by some of the members that Jefferson compared the opposition to "the ceaseless action of gravity, weighing upon us day and night."

SOMEDAY YOU WILL HEAR ME!

When young Disraeli arose in the British Parliament to make his maiden speech, it was in an atmosphere of ridicule and scorn. Undaunted, he ignored the laughter, taunts, grimaces, and gestures of contempt for a while, and then stopped suddenly and shouted, "The time will come when you *will* hear me." And it did: later he became Prime Minister of England, and one of the most highly respected statesmen and orators of the Empire.

THIS IS THE ONLY LIE DETECTOR

When I asked an inspector of New York detectives what he thought of the Keeler Polygraph (commonly

known as the "lie detector"), an instrument which has been used successfully in 3500 cases by its co-inventor, Dr. Leonard Keeler of Northwestern University, he shook a square-knuckled fist in my face and shouted belligerently, "*This is the only lie detector.*"—HENRY MORTON ROBINSON, "Our Tipstaff Police," *The North American Review*, September, 1935.

NO, LET'S PUMP BY HAND

Ericsson demonstrated, in 1828, the effectiveness of a steam fire engine in London, but municipal authority decided against it, and pumping was done by hand for 32 more years.—*Reader's Digest*, October, 1937.

BLIND HIM AND LOP OFF HIS ARM

Paola Vitelli was the leader of the famous "Armoured Knights of Italy," an organization which was equipped with mediaeval weapons and protection. When gunpowder appeared, Vitelli realized that this new invention would destroy his organization, as well, of course, as similar groups in other countries. Consequently, he issued an order that any man, soldier or civilian, who was caught with a firearm, should be immediately blinded and his right arm lopped off. It is interesting to note that Vitelli himself was beheaded in 1499 for having a gun in his possession.

OPENLY RIDICULED IN WASHINGTON

Eli Whitney, best known for his foolish idea of a cotton gin, had another foolish idea—muskets with interchangeable parts. "With such a gun," said he, "repairs or replacements could be made easily and immediately without having to send the whole weapon to the gunsmith."

He was openly ridiculed in Washington. However, he invited a number of skeptical government officials to attend a demonstration—and some of them came. Whitney laid out ten pieces of each part of his gun, and then, to the amazement of the “derisively indulgent” officials, assembled the ten guns, handing each, as it was completed, to a member of the group.

BUT LINCOLN LIKED IT

In 1862, Christopher Spencer took his invention—the repeating rifle—to Washington to see if he could interest the government in it. After being rebuffed several times by the War Department, he was successful in getting an interview with the President. Lincoln, who knew something about firearms, was interested and, “to my utter astonishment”—said Spencer later, suggested that they go out on the White House lawn and try it. They did so, Lincoln himself shooting several times at the mark they had set up. Returning to the White House, Lincoln asked to see the internal mechanism of the gun, and Spencer disassembled it and explained the functions of the various parts. And—Spencer got a government contract.

NOT SUITABLE AND NEVER WILL BE!

On October 9, 1901, a group of five United States army officers took their first official ride in an automobile—John Brisben Walker’s “Mobile Wagonette”—for the purpose of evaluating this new device as a possible substitute for horse and mule drawn wagons. Naturally, because the automobile was just passing from its experimental stage, the test was not a howling success. Brigadier General A. E. Bates, Chairman of the Board, submitted an unfavorable, but fair enough,

report, considering the youth of the automobile and the lack of roads.

But it was Captain John M. Carson Jr., Quartermaster, who in his report as a member of the Board, went all the way out on the end of the limb. "As a primary means of carrying troops and baggage," he said, "I do not consider the automobile at all suitable, nor do I believe it can ever be perfected so as to make it capable of supplying a reliable and efficient means of transportation of troops operating in the field and their baggage."—Army Meets Auto, BOYD B. STUTLER, *American Legion Magazine*, October 27, 1942, p. 10.

AMERICA DIDN'T LISTEN

In 1908, while the airplane was still in its infancy, Alexander Graham Bell, inventor of the telephone, prophesied that a nation which could control the air would control the world. He was ignored.

In 1918, Rear Admiral Robert E. Peary, discoverer of the North Pole, also emphasized the importance of the airplane by stating that it would be only a question of time before America would be vulnerable from the air. He was ridiculed.

In 1921, Brigadier General William L. ("Billy") Mitchell, Assistant Chief of the Army Air Service, declared that he could sink a battleship with bombs from the air, to which the Secretary of the Navy retorted that he would be willing to stand on the bridge of such a ship while the attempt was being made. Despite the Navy's scoffing, Congress ordered the test, and in June, 1921, four vessels, formerly of the German navy, were sunk by Mitchell's bombers. On September 26, 1921, seven Army bombers attacked

and sank the obsolete U. S. battleship *Alabama*. In 1923, Mitchell's bombers in a "repeat performance" sank two more obsolete U. S. battleships. Mitchell continued his campaign for an adequate air service, but America didn't listen.

AND—for his efforts, General Mitchell was demoted and later court-martialed and suspended for five years.

JAPAN LISTENED

In 1915, Admiral Yamamoto ("White-House-Peace-Dictator"), later Commander-in-Chief of the Japanese Combined Fleet and director of the Pearl Harbor, and other, spectacular attacks and invasions. was asked, "What do you consider *the* war vessel of the future?" He replied, "The most important ship of the future will be a ship to carry airplanes." When asked, "How do you expect to destroy a battleship except with a battleship?" he replied, "With torpedo planes. The fiercest serpent may be overcome with a swarm of ants." Japan listened. The recent results of Yamamoto's vision and planning are well known.

XIV

SOME UNFINISHED FOOLISHNESS

As was pointed out in the opening chapter of this book, it is easy for those of us who see the successful applications of a machine or procedure to condemn the skeptical attitudes of our earlier fellow-men toward this machine, or procedure when it was first suggested. But, at the same time, it is apparently just as easy for us to take this same skeptical attitude toward some new device or practice proposed now—something which tomorrow may be just as successful and useful as yesterday's scoffed-at item is today. In a word, it is easy to be inconsistent.

In the present chapter a number of foolish ideas which have already been suggested and are now being worked upon will be described. Few or none of them have been completed or have become well established; they are still in the experimental stage. Perhaps some of them never will become established. However, on the basis of progress made and present status, they all appear to offer some probability of success. Assuming that the reader was somewhat intolerant before he picked up this book, and that he has read enough of it to recognize the weakness of scoffing at new ideas, we can also assume, if his lesson has been well learned, that his reactions to these items of unfinished foolishness will be something other than incredulity and ridicule. And, of course, we hope that such will be the case. Well, let's see.

THEY RESURRECTED THE DEAD

Some thirty years ago two Russian professors, Drs. Theodore Andreiev and Alexander Kuliabko of Moscow, revived a man who had died on the operating table. Logically, one asked the other, "If it was done once, why can't it be done again?" So they repeated the experiment several times with human bodies. However, because of public opinion, they turned to hot-blooded animals, mostly dogs. In many experiments they killed the animals by means of poison or by extracting their blood and then revived them. In some instances they killed and revived an animal several times. Fifteen years ago another biologist and physician, Dr. W. N. Shamov, began similar experiments and had similar results.

Recently, Professor Andreiev made this statement: "Results of our experiments have convinced me absolutely that, provided the heart, lungs, and the other essential organs of the body are structurally intact, the dead can be revived. The principle has already been demonstrated successfully. It only remains for our surgeons to apply practically the results of our experiments."

REFITTING THE LIVING FROM THE DEAD

About a dozen years ago Dr. S. Yudin, a Russian surgeon, was called on a case in which a man had committed suicide by cutting an artery. Dr. Yudin was familiar with the experiments of Drs. Andreiev, Kuliabko, and Shamov, and hastily withdrew the blood from a fresh corpse in the hospital and injected it into the veins of the suicide. Two days later this patient was released from the hospital. Still later, Dr.

Yudin successfully revived three other somewhat similar cases.

Recognizing the possibilities of this procedure—if blood were immediately available—Dr. Yudin asked for the proper authorization, received it, and began to withdraw and store blood of sound corpses. And today a number of Russian hospitals draw off, classify, and store the blood of every corpse that is not diseased.

The success of these transfusions naturally lead to the other logical possibility—the transplanting of human organs. Scientists have established that the body does not immediately “die” when respiration and pulse stop, and also, that parts of it die at different rates of speed: for instance, the brain dies in 10 minutes; eyes, 30 minutes; internal muscles, 10 hours; blood cells, 18 hours; bones, 3 days; hair, roots and nails, 7 days. And, as a result, experiments in the removal, storing, and transplanting of livers, kidneys, glands, and other organs are being carried on in various parts of the world.

Dr. V. P. Filatov of the Odessa Eye institute saves and stores healthy eyes, later grafting the fronts onto the injured eyes of living patients. He has even stripped, stored, and later grafted human skin.

WHAT? COMPULSORY MEDICAL ATTENTION?

“Socialized medicine,” the mere mention of which causes the average physician to throw a fit, is already in the offing. Whether it will finally be in the form of state-supplied and state-controlled medicine, in the shape of group insurance, or in some other form, no one at the present time knows. Probably all of the various plans suggested have advantages and disad-

vantages. However, the theory of adequate medical attention for all, and especially for those unable to pay its heavy expense, is already fairly well established in the United States and may, for all practical purposes, be considered a present day reality.

"Compulsory medical attention," as far as general medical attention is concerned, is a relatively new idea, one not yet established in practice. However, in one field of medicine, broadly considered, such compulsion has for years been an accomplished fact; the mentally ill—the feeble-minded and the insane—have had "compulsory medical attention" for decades. Quarantine is another form of compulsory medicine. In certain settings, such as in the army, in the navy, and in many schools, vaccination or inoculation, or both, are compulsory.

The theory behind compulsory medicine is that the state has as much responsibility for the physical health of its citizens as it has for their intellectual health; that it is as reasonable for the state to require its citizens to be in as good physical health as possible as it is to require its coming citizens to go to school in order to be in as good mental and social health as possible.

Perhaps the state will require universal periodical physical examinations and, on the basis of the findings, compel the individuals needing it to have proper and adequate treatment, either by state physicians or by approved private practitioners. Or perhaps the state will ultimately take over, to a very large extent, the healing business, just as it has taken over, to a large extent, public education. And perhaps there are other ways in which the state will insure the general good health of its citizens.



Naturally, any such a proposal would be immediately met with the vitriolic scorn of the ballyhooing politician and of the super-patriot, and be tagged as "socialistic," "communistic," or what not. However, compulsory education, especially secondary education, was correspondingly tagged when it was first suggested in an early day. But it came in spite of violent opposition, and is now an accepted basic principle and practice of our democracy. And compulsory medical attention—

SENSATIONAL BALLYHOO AND BALDERDASH

When Professor Auguste Piccard, the distinguished Belgian, was planning his ascent into the stratosphere for purposes of investigating the spore life, sunlight, cosmic rays, temperature, pressure, and other scientific aspects of the "upper air," the eminent director of a well-known observatory stated: "Piccard will have interesting experiences, but I doubt that his observations will be of any scientific consequence. . . . It looks like a sensational ballyhoo stunt to me." This astronomer characterized Professor Piccard's plan for studying the cosmic rays as "balderdash."

Some time thereafter Piccard rose in his balloon to a height of more than 50,000 feet. In the second of the flights jointly sponsored by the National Geographic Society and the U. S. Army Air Corps, "Explorer II"—the world's largest successful balloon, weighing, complete with a ton of precision instruments and crew, 15,002 pounds, reached the highest altitude ever attained by man—72,395 feet.

Perhaps, as yet, these observations have been of no real consequence. But, at least, they represent a bit

of pioneering into something that we know nothing about—exactly the same type of inquiring into the unknown that has given us progress in all the other phases of our life.

NEW YORK TO PARIS IN NINETY MINUTES

Men have always dreamed of rocketing themselves to the moon. Dr. R. H. Goddard will not talk about flying to the moon, but he is interested in rocket travel. In fact, for twenty-eight years he has been testing space-exploring rockets. He used to teach at Clark University. In his spare time he made rockets and sent them shooting off into space. The townsfolk felt a little nervous about these skyrockets; so Dr. Goddard moved out West, where he could work at peace in the desert. He now has a machine that will send rockets hurtling through the skies at seven hundred miles an hour. Scientists think that someday it may be possible to hurl mail from New York to Paris in ninety minutes.—CAROL HOVIOUS, "Flying the Print-ways," pp. 177-178, D. C. Heath and Company, 1938.

SUPERCHARGED FLOUR

Modern milling machinery gave man white bread which is attractive but which contains little thiamin, riboflavin, and nicotinic acid, which are found largely in the husk of the grains. And these represent the difference between the sturdy whole-wheat bread of our grandfathers and the devitalized bread of today. But there are definite signs of improvement.

In 1936, R. R. Williams of the Bell Telephone Laboratories, after long experiments, finally made thiamin out of coal tar, and later, Dr. Russell Wilder

and associates of the Mayo Clinic proved, by an 88-day test on six women, that the lack of thiamin causes psychoneurosis. So thiamin, formerly very expensive, is on the way. Nicotinic acid is inexpensive, and riboflavin will be inexpensive in mass production.

In 1940, the Miller's National Federation recommended the production of supercharged flour containing the proper amounts of thiamin, riboflavin, and nicotinic acid. And a large percentage of America's white bread is already enriched with thiamin and nicotinic acid. With this supercharged flour of tomorrow, bread will still be pretty and white, but it will contain the vitamins that modern milling removes.—Briefed from PAUL DE KRUIF, "Supercharged Flour—an Epochal Advance," *Reader's Digest*, January, 1941.

WOMEN WILL SOON ENJOY THEM

About a century ago, led by Lucretia Mott, Elizabeth Cady Stanton and Susan B. Anthony, women began the "Equal Rights" movement in the United States. Among the demands made at this first convention in 1848 were: equal rights in the franchise, in education, in industry, in the professions, in political offices, in personal freedom, in guardianship of children, in making contracts, in the church, and in leadership in all moral and public movements.

Everyone knows the vigorous and often violent opposition that arose against that movement, and how, despite this strenuous opposition, in 1920 the women were granted the right to vote. Not all discriminatory practices, policies and procedures have been removed, but the fight still goes on, and present trends point to

the not-far future when the women will actually enjoy the same rights and privileges as the men.

WEEDING THE HUMAN GARDEN

"The state has as good a right to remove undesirable citizens as a gardener has to weed his garden."—Dean Inge.

Poor heredity is the greatest single cause of mental deficiency—from 50 to 65 per cent. Thus if all the feeble-minded were prevented from bearing children, we would stamp out most of the group which prevents social progress, from one to two million persons.

In the Kallikak family, 480 offspring were traced from the illegitimate birth of a son from a normal father and a feeble-minded mother. All but 46 were degenerates of various types. During the six generations following a subsequent marriage of the original father to a normal woman, 496 offspring were born, only one abnormal. Similarly the Jukes family produced 1200 defectives in six generations.

It would have cost but \$150 to have sterilized the original couple from whom seemingly endless social sores resulted wherever members of the family settled. Yet the actual cost in relief for only one of the families was estimated at over two millions in 1916.

Sterilization is a simple operation which involves the removal of no organs. To sterilize the male a small portion of each sperm duct is removed, and for the female, a small portion of each Fallopian tube. Progeny is stopped, but neither the glandular function nor the ability or desire to perform sexual intercourse is hindered.

In 1907 the first sterilization statute in America

was passed in Indiana. Today (1933) in 26 states sterilization may be legally practiced. So far, some 15,000 mental defectives have been sterilized, more than half of them in California. Alberta in Canada, Vera Cruz in Mexico, Canton of Vaud in Switzerland, Denmark, and Finland, have passed sterilization laws. In 1930, 223 of the 247 members of the scientifically-minded American Association for the Study of the Feeble-Minded approved the principle of sterilization.

Sooner or later society will have to realize that indiscriminate propagation of the human race does not accrue to its best interests and will think in terms of quality instead of quantity in dealing with the problems of reproduction.—“The Question of Sterilization, A Symposium,” *Birth Control Review*, April, 1933.

HARNESSING THE BLOWS, BIG AND LITTLE

For centuries man has harnessed the wind; it has pushed his vessels to all parts of the globe; it has pumped water and ground food. Comparatively recently, it has been used to run generators and charge batteries. In 1924 the sail-less Flettner Rotor Ship, “Buckav,” even crossed the ocean with the wind operating its rotors and through these its propellers. And there have been a number of suggestions concerning devices by means of which land vehicles could be propelled, directly or indirectly, by the wind.

Obviously, at the present time, at least, the wind is not dependable; its velocity varies widely from minute to minute, hour to hour, day to day, and even from season to season; and, of course, it also varies from locality to locality. However, in time, doubtless many or all of the varied problems of capitalization and transmission of this at-present-largely-unhar-

nessed power will be solved, and it will take its place alongside the other forms which have been gathered from nature.

GLASS HOUSES THAT STONES WON'T HARM

The Corning Glass Company, Corning, New York, has, during the last few years, developed and produced some 25,000 magnificently versatile variations of glass, such as, to illustrate with a few, acid-resisting glass bolts and nuts, unbreakable dishes, filaments so fine that a one-pound batch would stretch around the earth, the 20-ton reflector for the Mt. Palomar telescope, thermometers with bores one-third the diameter of a human hair, a bronchoscope light bulb no larger than a grain of wheat, and special insulators to withstand the tremendous voltage and shock of the cyclotron—the “atom smasher.”

However, President Armory Houghton isn't satisfied. He forsees houses built with glass bricks and partitioned with glass bubble slabs which may be sawed and nailed; furnished with glass tables and chairs and draped with glass textiles; equipped with windows which permit light to enter but none to escape—thereby maintaining privacy in a sunlit room. He envisions piping and plumbing fixtures made of glass; automobiles insulated with glass wool and running on roads paved with glass blocks. He dreams of malleable glass which can be worked on machine-shop lathes.—Adapted from J. T. RATCLIFF, “Glass Magic,” *The American Mercury*, July, 1940.

PUT THE SEA TO WORK

Another of man's ancient dreams is that of capturing the enormous energy of the sea—tides and waves



—and putting it to work. Several serious attempts have been made, and while these are still in only the pioneering stage, they do represent possibilities. For instance, harnessing the tides, considered the simpler of the two, is even now done in a small way by catching the water when the tide is at its full, holding it when the tide goes out, and then allowing this captured water to run back into the sea over or under water-wheels or through turbines, thereby transforming it to usable energy. The fact that the tides come in and go out with such clock-like regularity simplifies one of the basic difficulties now present in attempts to harness sunlight and wind.

Harnessing the waves by means of splash-paddles, splash-boards and similar devices against which the waves push and pull, either above or below the water, offers somewhat more difficult problems than harnessing the tide because of the irregularity of the waves, but even these difficulties may, in time, be solved satisfactorily. In any case, here are two possibilities of directly capitalizing one of nature's prodigious sources of power, possibilities that the really intelligent individual will not ridicule.

PIPE THE GAS—DON'T HAUL THE COAL

In Siberia and North Caucasia, USSR mining engineers are burning coal mines underground for their gas content. Suggested by the famous British chemist, Sir William Ramsey, before the turn of the century as the most economical way to use coal deposits of the lower grades, the scheme has been little used elsewhere in the world.

Sir William argued logically that for many purposes it was wasteful to dig mines and extensive cross

shafts, send down men to dig out the coal, ship it hundreds and thousands of miles and finally burn it to make coal gas for illumination, cooking and power. He recommended setting a coal deposit on fire and then by controlled draft and flues leading the coal gas to the surface. According to Russian tests the labor spent on the gas is only from one-tenth to one-sixth of that needed in mining. Moreover, it is possible to obtain gas from very narrow sheets of buried coal which would be unprofitable to mine in the ordinary way.—*Science-Supplement*.

MAKING MORE OF THE HORSES WORK

Mr. Sloan, President of the General Motors Corporation, has stated that a gallon of gasoline contains enough energy to drive a light car 400 miles. The following table from the General Motors Research Laboratory shows how the energy of the gasoline is expended in an automobile.

Heating the cooling water	40 per cent
Transmission friction	2 per cent
Engine friction and losses	10 per cent
Incompletely burned fuel	20 per cent
Heat in gas	20 per cent
Useful work	8 per cent

Total	100 per cent
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Obviously, a device in which only eight per cent of the motive power is transferred into useful work represents inefficiency. And, although at present there appears to be an ample supply of gasoline for many years, undoubtedly, as the more or less non-essential refinements of body, windows, upholstery, and gadgets are completed, the automotive engineers

will again turn their attention to the mechanism itself in an effort to conserve fuel by developing a more efficient engine and power transmission device. Certainly the ratio of useful work to basic power will be much greater in the car of tomorrow than it is in the car of today.

ENGINELESS, PROPELLERLESS, RADIO-CONTROLLED AIRPLANES

Recently, Sir Alliott Verdon-Roe, world famous aircraft designer, who in 1910 prophesied that in 30 years there would be a trans-Atlantic air service, said:

"By 1958 there will be engineless and propellerless airplanes that will soar through the stratosphere at speeds of nearly 1000 miles an hour. These planes will be controlled from the ground by radio, their motive power will be dependent upon a continuous supply of gas discharged at high pressure from a slot in the trailing edge of the wings. Such a method will give three times the amount of energy from the same amount of fuel, and flying costs will be cut two-thirds. The number of passengers such a plane would carry would be enormous—200 is a low estimate. People will be able to have a late lunch in London and an early tea in New York."

HIGH FLYING

Most certainly in the future, airplanes will fly at a much higher altitude, especially on the longer trips, than they do today. Flying at great heights will insure that they have better and more uniform weather, and the decreased resistance will increase their speeds. Sealed cabins, supercharged motors, variable pitch propellers, improved streamlining and more efficient

wing-loading are some of the elements which will help to make high flying fast, comfortable, and safe.

THE FLYING MILKMAN

An airplane which can carry a flying milkman from door to door is an accomplished fact. He could stop his plane in the air while he deposited bottles, picked up empties. All he would need would be a window-high shelf. In fact he could fly within two feet of you when you called for an extra bottle of cream, and place it in your hands. He could back away—always the courteous milkman, even in the air. Then he could speed away at 30 to 40 miles an hour to the next house.

This can be done, because it has been done, except that the flyer wasn't a milkman and instead of a bottle of cream it was a suitcase. The plane at present wouldn't fit all yards, but it would do for most.

The flying milkman plane is a helicopter, called VS-300, built by I. I. Sikorsky of the Vought-Sikorsky Company, United Aircraft Corporation. It flies straight up, stands still in the air, flies backward and has done 30 to 40 miles straightway, and performed well in a 25-mile wind. The tests have been under way for nearly a year.—*Associated Press*, February 6, 1941.

MELT THE GLACIERS AND ICEBERGS

A few years ago a fool had a notion whereby, he figured, a single engineering feat would, quite likely, double the habitable part of the globe.

He knew that the warm Black Stream, or Japan Current, a part of the North Equatorial Current of the Pacific Ocean, flows north and then turns south-



ward, thus getting into a sort of merry-go-round. He suggested that it might be possible to blast the shallow, 35-mile-wide Bering Strait wider, and so allow a part of this ocean stream to get into the Arctic Ocean through this bottle neck. It would, he figured, become a sort of Pacific Gulf Stream, which would ultimately melt the Arctic icepack, and raise the temperature of Canada and Alaska. It would reduce the glaciers in Greenland and eliminate all icebergs in the Atlantic. Obviously, he contended, it would make thousands of square miles of territory available for cultivation and habitation, and perhaps, even bring the discovery of valuable land now covered with snow and ice.

Was the plan ridiculed by those to whom this fool suggested it? It was. What became of the plan? It was buried away in his personal papers and was only recently, after his death, discovered. And who was the fool with this fantastic idea? Charles P. Steinmetz!

WHY NOT ADOPT MORE GENERALLY?

Said Senator George Norris of Nebraska, while fighting nearly every newspaper and politician in the state for a unicameral (one-house) legislature:

"The outstanding evil of the bicameral system is that it enables politicians to escape responsibility for their official acts. Each house is able to pass the buck to the other, while a conference committee, acting behind closed doors and without any record being made of their votes, really does the dirty work. The most important decisions are made by five or six men not elected for that particular purpose, and whose names usually go unnoticed by the public."

Senator Norris won. Nebraska's new legislature

is composed of 43 members who are elected on their own platforms (non-partisan ballot) and paid \$872.90 a year. Normally, the legislature meets only once every two years.

As a result of this reorganization, movements for a similarly elected and organized legislative body have been started in more than half of the other states of the Union.

COULD DISCARD WIRE, METERS, AND ACCOUNT BOOKS

If all the sunlight which falls on the earth's surface for one minute could be harnessed, it would supply the world's present heat and power requirements for an entire year. . . . The solar energy falling on an arid region is equivalent to about a million horsepower per square mile. This would be a year-round average, for night and day, summer and winter, clear and cloudy. Harnessing the sunlight on about 200 square miles of the Mohave Desert all the year round would supply our nation's present demands.

On clear summer days the energy falling on a patch of the American roof containing about 10 square feet is equivalent to about one horsepower (while the sun is shining)—more than enough to run all the electric appliances in the average home continuously. If I could capture and store the excess heat that falls on my roof in the summer I would have considerably more than enough units to keep my house comfortable during the winter, and even leave the windows open part of the time if I cared to. I could laugh at all coal, gas, or other dealers and tell the power company to roll up all their copper wire and throw it on the scrap heap with their obsolete meters and account books that tell the tyranny of high costs.—C. C.



FURNAS, "The Next Hundred Years," p. 213, Blue Ribbon Books, Inc, 1936.

THE SAHARA MAY BECOME A GARDEN

Last autumn a patent was granted to Dr. C. G. Abbot, secretary of the Smithsonian Institution, for a simple and inexpensive solar power machine which is capable of competing with coal in the generation of steam. This device captures the sun's rays on a trough-like aluminum mirror driven by clockwork to follow the sun's movements. The mirror brings the rays to a hot focus upon a glass tube containing a thin stream of water. On a bright day, the water soon becomes hot enough to flash into steam. Dr. Abbot's solar machine can do all kinds of cooking satisfactorily. Insulation so preserves the temperature of the water overnight that in the morning there is heat enough left to bake biscuits.

In a month the sun lavishes on the earth as much energy as man will ever get from all the coal that lies beneath it. With the development of means to transmit electricity—now in prospect—one can imagine a big international company building a world-wide ring of solar power stations on which the sun never sets.

There is also promise in the use of thermocouples and photo-electric cells which transmit radiant energy, such as we get from the sun, directly into electric current. If the present rate of progress continues, we may some day live in houses covered with "photo-electric shingles" which provide all the household light and power—since the sun pours down upon a good-sized roof in a single cloudless midsummer day as much electrical energy as the average family now uses in a year.

For the present, this is a pipe dream—as once were airplanes, radio and television. The attack upon the sun as a source of power is organized and financed not only in private and industrial laboratories, but also at the Massachusetts Institute of Technology, recently endowed with \$600,000 for research on the problem.

These researches suggest strange possibilities. Cheap, abundant solar power might change the Sahara Desert, Arabia, and Palestine into thickly populated gardens; our own arid West might be irrigated and fertilized by the sun that now curses it. And nations may scramble, not for coal and oil, but for the great sunlit desert spaces.—G. EDWARD PENDRAY, "Take a Look at the Future," *The North American Review*, Summer, 1939.

"THIRTY DAYS HATH SEPTEMBER"—FORGET IT

Our present calendar is a proverbial "mess." To illustrate: some months have four payrolls, some have five; court terms are set by "the first Monday after the first Sunday," and school terms by "the first Tuesday," circumlocutions; Easter may occur anywhere from March 22 to April 25; and federal quarters have 90, 91, 92, and 93 days. And there are other illustrations of confusion.

However, a new calendar is on the way, due to the influence and work of a number of great national and international organizations.

The League of Nations began a consideration of the problem in 1923 and soon was considering 185 different proposed calendars. But, in general, at the present time only two calendars are being studied—the Positivist Calendar and the World Calendar.

The Positivist Calendar is composed of 13 four-week months, "Sol" coming between June and July. An unnumbered extra day at the end of December, and a leap year every fourth year at the end of June, complete this calendar.

In the World Calendar, which is receiving most attention, there would be four equal quarters, composed of 13 weeks, each week beginning on Sunday. Each quarter would contain one month of 31, and two months of 30, days. The extra day, the 365th, would be an extra Saturday—"Year End Day." The "leap year day" would come at the end of June.—Briefed from ANTHONY M. TURANO, "The Calendar is Out of Date," *The American Mercury*, February, 1939.

BIG BERRIES AND LARGE FLOWERS

Colchicine, a poisonous drug extracted from the roots of the ordinary autumn crocus, can be used on many sorts of vegetation to speed up enormously—perhaps 1000 times—the process of producing "sports," accidental variations, some of which can be perpetuated. There is good reason to hope that within a year or two your table will have giant strawberries and blackberries, double the size of any present species, and superior to them in flavor. Radishes the size of turnips are to be expected. Garden flowers should soon be available in giant sizes and many new colors. Sugar cane is being bred with stalks several times larger than is now usual, and with a higher vitamin content. Tobacco, cotton, and many other plants will be larger, finer, and more resistant to disease.—BRUCE BLIVEN, "Our Future as Scientists Foresee It," *The New Republic*, November 18, 1940.

AGRICULTURE STILL IN THE DARK AGES

Agriculture, our biggest business—some \$10,000,000 a year—despite modern machines, improved crops, soil-conservation plans, and distributive organization, is still in the Dark Ages. We still have pests—grasshoppers, weevils, flies, termites, fleas, mosquitoes, ticks, gypsy and coddling moths, beetles, lice, and other enemies which destroy man's food and materials, worry his animals, and carry disease. We still have blights, wilts, rusts, smuts, blotches, smudges, mildews, rots, cankers, curls, scabs, and galls that affect plants, trees, vegetables, and fruits. We still have over-worked and eroded land. We still have uncertain and unpredictable weather. We still have small-farm individual-enterprise organization with its prodigious losses—wastes of some 200,000,000 tons of farm-produced stuff each year.

However, better days for agriculture are on the way. Some of the evidences of these new days are the many experiments now being conducted in:

The control of insects and plant ills, by means of quarantines, insecticides, soil and seed treatments, introduction of natural enemies, and crop manipulation.

The control of floods and drouths, by means of dikes, dams, void-gulleys, reforestation, and irrigation.

“Artificial weather.” Houghton of Massachusetts Tech has produced rain in his laboratory. “Controlled temperature” is already used in orchards in certain parts of the country; and “artificial sunlight” is now common in poultry raising. General Electric has already produced arcs of 13,000 degrees, 4,000 degrees hotter than the sun.



Elimination of wastes. Corn stalks, for instance, which were formerly burned as waste, are now being used in several substitutes for wood. Iowa State College has named more than a hundred products that can be made from whole corn—stalks, husks, cobs, and grain.

Cooperative farming, in which small-area farms are combined for purposes of economy and efficiency—the “mass production” idea. Modern machinery and combined producing, manufacturing, and distributing organization will also help to make farming a really scientific enterprise.

GARLION, TOPEPPO, CITRANGE, PEACHERINE, TANGELO

Plants were first made patentable in this country in 1930, and since then about 150 patents have been issued. More than one-fourth of the fruits and vegetables we eat were unknown ten or fifteen years ago; and these come from strains of plants that did not exist two decades ago. For instance, some of these new developments are:

- Mildew resisting cantaloupe
- Disease resisting tomatoes
- Slime and wilt resisting lettuce
- Leaf, instead of rolled-stalk, onion
- Small-cobbed corn, capable of being canned in the ear
- Garlion—cross between garlic and onion
- Topeppo—cross between tomato and pepper
- Odorless onion and cabbage
- Lemon cucumber that grows on a vine
- Giant cucumber, as long as your arm
- String beans a yard long
- Coreless carrots

Utah celery—stringless and better flavored
Seedless grape that ripens in July instead of
October

Boysenberry, a loganberry-raspberry-black-
berry

Shaddock—pink, delicious-fleshed relative of
grapefruit

Citrange—a hybrid resembling a grapefruit

Tangelo—a cross between the tangerine and the
grapefruit

Seedless watermelon

Double-blossomed nasturtium

Rust-free snapdragon

Peacherine—yellow peach with white nectarine

—“Tailor-Made Plants,” *Popular Mechanics*, July,
1936.

STREAM-LINED PIGS, SUPER-DOGS, AND FRIENDLY BEES

Some of the unusual projects on which the United States Department of Agriculture's Research Center at Beltsville, Maryland, have already made progress are: poultry with nearly all white or dark meat, as desired; colored eggs; super-dogs, more intelligent; improved bees, with longer “noses,” better dispositions, larger storage spaces, and greater cold-weather flying abilities; sun-proof stream-lined pigs with more meat and less fat; fuzz-free peaches; tree-ripened-and-colored apples; and family-sized watermelons.—*The American Magazine*, November, 1941.

WEALTH IN THE SEA

With the exception of air, the earth has more water than it has anything else, and most of this water is ocean water. And man is just now discovering wealth

in this seemingly worthless ocean water—wealth that he never before dreamed of. Already he has abstracted gold, silver, copper, zinc, phosphorus, magnesium, lead, iodine, tin, radium, bromine, and many other materials from ocean water, and he has only made a beginning. Who knows what he will find next? And who knows in what quantities he will find it?

COLD LIGHT IS AROUND THE CORNER

The filament of an electric lamp, when heated to some 2300 degrees, becomes incandescent—it gives off light. But it also gives off a great deal of heat. It is only about two per cent efficient. Obviously, “cold light” would be much better.

And there are some examples of such light. Certain deep-sea fish and the lightning bug are chemiluminescent—they carry “cold light.” Neon signs are electroluminescent—they, too, carry “cold light.” A less-developed possibility is autoluminescence—in which decomposing thorium, radium, or other materials used as paint would give off light.

A LIST OF OTHER UNFINISHED FOOLISHNESSES

It would be practically impossible to present a complete list of the unfinished foolishnesses of the world because, (1) such a list would have to cover every phase of man’s activity, (2) it would be obsolete by the time it could be published, and (3) even a fairly complete list, if we had it, would require much more space than is here available. However, a few of these unfinished foolishnesses may be suggestive. It may be worth-while to emphasize that pioneering work

has already been done in every one of these items and areas:

- Air conditioning
- Artificial daylight
- Atomic investigation
- Compulsory life insurance
- Cosmic rays
- Elimination of superstitions
- Exploration of the stratosphere
- Frozen foods
- Grade crossing elimination
- Heavy water
- High speed highways
- Home modernization
- Improved economic system
- Improved political organization
- Manufactured gasoline
- Microfilm books
- Preventive medicine
- Psychic phenomena
- Radioactivity
- Recreation facilities for all
- Soilless agriculture
- Solar power
- Submarine wealth
- Submarine transportation
- Synthetic fibers, foods, plastics
- Synthetic vitamins, hormones
- Wireless transmission of power
- Utilization of Polar areas

STILL ROOM FOR FOOLISHNESS IN AMERICA

Despite the marvelous progress that has been made in our country during the past century, there is still

plenty of room for further progress and improvement.

Although America is probably the richest nation in history, most of its enormous wealth is concentrated in the hands of the few who use it as they see fit, often deleteriously; we have a fifty billion dollar income, but one-fifth of the population is on relief or charity; we have the largest industries and the most highly skilled workers in the world, but twelve million wage earners are unemployed; our modern buildings and equipment amaze visitors from foreign countries, and yet nine million American families live in homes unfit for human occupation.

Inventions enable us to export eight million bales of cotton annually, and yet eight million people of the cotton belts live on sub-subsistence levels; having surpluses, we destroy young food animals and curtail crops, and yet millions of our people go hungry; a miner digs four or five tons of coal a day, but he lives in a hovel and his community is a tinder box; the transport companies have conquered sea, land and air, but they still build battleships, submarines, tanks, armored cars and bombers to spread destruction among our fellow men.

Despite the boast about our "Christian nation," a great majority of our people rarely or never enter its thousands and thousands of religious institutions; we extol our democracy, but demagoguery and rotten politics are common; we have the greatest educational system the world has ever seen, but ignorance, superstition and worship of tradition still exist; we have numerous institutions of learning, and also corruption in high places; we have equal suffrage for all, but there is still ignorant voting, and vote-buying and

selling; we have creeds, codes, oaths, and slogans and other citizenship-training devices without number, but our annual crime cost is thirteen billions of dollars.

Yes, there is still room for "foolishness" in America.

XV

WHY ARE FOOLS FOOLS?

*Truths would you teach to save a sinking land,
All shun you, none aid you, and few understand.*

Why are fools fools? They are fools, not because they have new ideas about things, processes, devices, or applications—they are fools only because their fellow men so label them. Obviously, they may be, and often are, exceedingly wise men. However, they are so far ahead in their thinking that society is unable to understand their proposed innovations or appreciate either the application or the significance of those innovations. Often these fools are really “born thirty years too soon,” as a popular series of present day cartoons expresses it.

A very brief consideration of a few of the most common of these opposers will shed light on the reasons for their intolerance and so help to answer the above question. Naturally, in addition to the hostile reactors discussed here, and there are others, there are also all sorts of combinations of all of these.

1. THE OPTIMIST—This individual is a witless creature who is perfectly satisfied with things as they are, and who has neither the ability nor the ambition to think of further improvements or additional innovations. To him the world is more or less perfect. He does not see sense in Tennyson's

Yet I doubt not through the ages,
One increasing purpose runs,
And the thoughts of men are widened

With the process of the suns.

—*Locksley Hall*

Nor in Lowell's

New occasions teach new duties,
Time makes ancient good uncouth,
They must upward still and onward
Who would keep abreast of truth.
Lo, before us gleam her campfires,
We ourselves must pilgrims be,
Launch our Mayflower, and steer boldly
Through the desperate winter sea,
Nor attempt the future's portal
With the past's blood-rusted key.

—*The Present Crisis*

A good illustration is that of a certain director of the United States Patent Office, who, about the middle of the past century, gave up his position and went to look for other employment because he thought the Office would soon close for lack of business.¹ This type of opposer is almost harmless because he is merely a passive discourager; he is not an active scoffer. Too, there are not very many of him.

2. THE "OH, YEAH" YAWNER—This is the indifferent and harmless individual who greets the news of an innovation with an "Oh, Yeah" yawn, and lets it go at that. His attitude may vary all the way from a fleeting and immediately forgotten glimpse to a more

¹When the federal government established the Patent Office as a separate bureau in 1836, the staff consisted of a commissioner, an examiner, and two clerks. Today the staff consists of a commissioner, three assistant commissioners, about 650 examiners, and a clerical force of more than 600. Some 2,200,000 patents have been issued by this office during the past 150 years.

lasting amused curiosity, but it has no depth, and results in no vigor of thought or action. Probably he has little in the way of either the necessary intelligence or experience with which to judge the item. He lacks the ability to understand the innovation, recognize its possible applications, or appreciate its importance—or if he has this, he lacks the ambition to make the effort necessary properly to understand, recognize, and appreciate. So he just lazily glances at the new idea for a moment and then turns his attention to something else, merely refusing to become interested. His attitude is but that of an animal.

3. THE "OH, YEAH" MOUTHER—This individual goes a step beyond the "Oh, Yeah" yawner. He is, generally speaking, a yawning "Oh, Yeah" man, but he does not stop with his contemptuous expression of doubt. A born opposer, he immediately begins talking and attempts to have his brain do a bit of thinking while his mouth is pouring out "arguments" against the innovation. He talks first and thinks—if at all—second. His mouthings represent his brain's "hold-the-fort-for-I-am-coming" attitude. And, often, it fails to come. He tries to "get the jump," to overwhelm all opposition with verbosity. And, if he hits upon what appears to be a somewhat logical argument, he emphasizes it to the extreme. He listens not to counter argument. His mind is already made up. If, when he stops for breath, the new-idea promoter begins to demolish his groundless attacks, or to show the merits of the case, he pulls into his shell and stays there. He has never learned that "it is better to keep one's mouth shut and be thought a fool, than to open it and leave no doubt of it."

4. THE PESSIMIST—This opposer of the new is a confirmed skeptic, suspicious, hostile, and fearful. If he recognizes the practicability of an innovation, he sees only the possible bad effects. He can see the possible deleterious effects of printing and teaching everyone to read, but he does not see how these could be used advantageously in religious or any other type of instruction; he resists the automobile and the radio as church-attendance decreasers, but does not appreciate how the first might actually make for increased attendance, and the second for increased worship; he sees explosives only as destroyers in war, not their many uses in time of peace; he sees airplanes only as bomb carriers, not as transportation facilities; he sees firearms only as devices of war and crime, never as instruments of protection or recreation. In short, he sees only the disastrous effects of fire and water, and not their many salutary and beneficial utilizations. He is the original “we-want-sunshine-all-the-time” individual who takes a sour “we-get-rain-all-the-time” attitude. And he is this because he does not think, if he discriminatingly thinks at all, far enough. Just one more step in his thinking would reveal the beneficial possibilities of an innovation.

Further, this individual usually lives in the past, and often has little interest in the present. He is the man who will not look at the new moon out of respect for that ancient institution, the old moon. In fact, he notes the many apparently-coming changes about him and believes that “the world is going to the dogs.” He has never heard of Voltaire’s statements—“The worship of precedent is the death of progress,” and “He who has not the spirit of his age has all the misery of it.” A few quotations will illustrate.

We are living in a dying and decadent age. Youth is corrupt, lacking in respect for their elders, impatient of restraint. Age-old truth is doubted, and the teaching of the fathers questioned. The signs of the time forecast the destruction of the world at an early date, and the end of time.—Inscription on an ancient Egyptian tomb.

Society has played out its last stroke. It is checkmated. Young men have no hope. Adults stand idle in the streets. None calls us to labor. The present generation is bankrupt of principles and hope.—RALPH WALDO EMERSON.

Grandma said it to grandpa
And mother said it to dad—
“I don’t know what we’re coming to,
“The children are so bad.”

Nor is this pessimist able to see the wisdom underlying age comparisons such as are indicated in the following bit of anonymous verse:

My grand-dad, viewing earth’s worn cogs, said
“Things are going to the dogs.”
His grand-dad, in his house of logs, said
“Things are going to the dogs.”
His grand-dad in his Flemish bogs, said
“Things are going to the dogs.”
His grand-dad, in his old skin togs, said
“Things are going to the dogs.”
Well, this is what I have to state—
“The dogs have had a long, long wait.”

5. THE SHORT-SIGHTED—This is the individual who perhaps understands a new bit of foolishness,

and who may even be intrigued by its novelty, but who recognizes no practical application of it. He considers it merely a scientific toy, interesting, but unimportant. Time and again this expression, "scientific toy," is to be found in the histories of inventions. As a matter of fact, many of our "modern" inventions are not modern at all; basic principles were expounded and models and even full-size working devices were constructed years ago. To illustrate with a few:

Mechanical toys were common in Egypt 4,000 years ago; Moses formulated an almost modern code of health to protect the children of Israel in their wanderings; Hippocrates in the fifth century B.C. used much of the modern physician's routine; the idea of the modern eye-glass, the contact lens, was expounded by the English physicist Herschel in 1827, and experimentation was actually begun at the great Zeiss factory at Jena in the 1880's; a hand-powered military tank was designed and used as early as 1558; "Greek Fire," the older form of our modern thermite, was used long before the Christian era; the compound microscope was considered merely an "interesting toy" for two centuries after its invention; the helicopter idea came out first in a toy in 1796; radio impulses were transmitted in 1840; the Geissler tube, practically our neon sign of today, appeared in 1860; vitamins were discovered in 1902; and the electric range has been under the process of development for more than thirty years.

Other interesting contrivances invented early but applied late are: diving suit, 1405; wind turbine, 1438; fire engine, 1518; diving bell, 1535; tide mill pump, 1582; submarine, about 1500; "magic lantern," in the

1600's; blast furnace and rolling mill, 1713; paddle-wheel boat, 1787; reaper, 1794; automobile, 1807; telegraph, 1809; motion pictures, proposed, 1833, successful, 1895; elevator, hydraulic, 1846, electric, 1880; television, 1855, patented in 1884; streamlined trains, 1874; synthetic rubber, 1866; automatic stoker, about 1885; "electric eye," early 1900's; four-wheeled brakes, 1904; night baseball, about 1910.

Leonardo da Vinci (1472-1519) was one of the most versatile "greats" in the history of the world. He was a distinguished painter, sculptor, writer, architect, and engineer, and he can be classed with the most famous inventors of all time. His long list of inventions includes such devices as the centrifugal pump, dredge, breech-loading cannon, rifled firearms, roller bearing, universal joint, conical screw, link chain, submarine boat, bevel gears, spiral gears, silk doubling and winding apparatus, spindle and flyer, parachute, lamp chimney, and ready-cut house. In addition, da Vinci was an aviation enthusiast; although his sketches do not reveal an interest in the fixed-wing type of airplane, yet he invented the rotating-wing type—the modern helicopter, and also the airplane propellor. Apparently, da Vinci was not "born thirty years too soon," but 400 years too soon. Practical applications of nearly all of his inventions came centuries after his death.

Undoubtedly various factors, alone or in combination, prevented immediate application of these and other inventions. But certainly at or near the top of the list would be the general attitude of individuals, professionally interested or otherwise, who failed to recognize the possibilities of such application, or who, if they did, discouraged or suppressed it.

6. THE EXPERT—It must not be assumed that the “ignorant man of the street” is the only scoffer at innovations; scientific and professionally minded scoffers have long been common. Generally speaking, these individuals could be easily classified with those of the preceding section, but they are presented separately in order to emphasize the point that even the supposedly initiated have been known to ridicule and oppose new ideas. A few examples will illustrate:

Priestly lampooned Lavoisier’s theory of the oxygenation of the blood; Victor Hugo railed at Fulton’s steamboat; Isaac Newton and Simon Newcomb belittled the possibilities of human flight; H. G. Wells scoffed at the idea of a submarine; Bruno and Rousseau rejected the idea of education for women; and Walpole, Samuel Johnson and Lloyd-George ridiculed the idea of equal rights for women; Stephenson could not find a single engineer who was willing to appear before Parliament to give support to his railroad idea; Sir Humphrey, Lord Byron, and Sir Walter Scott jibed at the idea of gas lights; Vanderbilt ordered Westinghouse out of his office; Damrosch and Severensky scorned the idea that music could be taught by mail; Schwab saw no possibilities of financial profit in the Wrights’ airplane, Morgan saw none in the automobile, and Depew saw none in Ford stock; Carnegie could imagine no improvements on a 1905 Winton car; John Muir bitterly condemned the project of converting the Hetch-Hetchy Valley into an artificial lake for power and water for San Francisco; Lodge failed to appreciate the practical possibilities of wireless; artists scoffed at Barnard’s statue of Lincoln; Harper’s rejected three of Kipling’s best known

stories, all on the same morning; and *The Atlantic* returned the manuscript of "David Harum."¹

7. THE PURIST—The "purist" is the man who decries the mania for making practical applications of every new discovery, invention, or process. He is well represented by the English scholar who some years ago remarked, "Thank God, here's something for which no one can possibly find any practical value." Of course, even he might be mistaken; practical uses might be found, even as they have been in the case of the examples listed in the two preceding sections. However, this scoffer is of relatively little importance in the present discussion because there are so few of him.

A variation of this "Purist" is the individual who considers all inventors to be commercially-minded saboteurs of society. He points out, often accurately too, that very few of man's inventions come in response to public demand; most of them originate because some individual recognizes a "need"—which this scoffer designates an "unnecessary need" because it is not felt by the great majority of the members of society. Consequently, he rates all inventors as pub-

¹A most encouraging recent development is the establishment, in August, 1940, at Washington, D. C., of the National Inventor's Council. This group of distinguished scientists and engineers has only one reason for existence—to listen to all inventions, cracked and otherwise, and tap them for soundness. Said Conway Coe, U. S. Patent Commissioner, following this first meeting: "We expect to get about 10,000 inventions a year. If ten of them prove to be useful . . . the idea will have been very much worth-while. There's no such thing as a crackpot inventor. Edison might have been the crackpot of the century . . . but his stuff clicked."

licity-seeking enemies who deliberately set about to create hypothetical needs by producing devices which will satisfy them. He has no respect for farsightedness. To him the majority is always right. He cannot appreciate the fact that the majority is usually wrong; that is, in its thinking and planning, the creative minority is almost always ahead of the majority.

8. THE RELIGIOUS-MINDED—This individual represents one of the most important reasons why fools are fools. A second most important reason, the "Job-Saver," will be treated in the following section. Both of these will be discussed at some length in order to show the many implications involved.

Man has always been religiously minded. Doubtless ever since he saw the first flash of lightning, heard the first clap of thunder, felt rain for the first time, recognized the regularity with which the sun and moon rose and set, and noted the marvelous growth of plants and the adaptation of animal and insect life to particularized habitats, his primitive mind pondered these phenomena. Slowly he began to realize that some higher power or force had organized his environment and was maintaining it.

Soon came his explanation—super-men or gods, one for each of these mysterious phenomena. He early noted that he had two kinds of experience, one unpleasant, terrifying, painful and "bad," and the other delightful, satisfying, happy, and "good." Then it was easy for him to assume that there were two kinds of gods, "bad" and "good," and also that these were always more or less in conflict. Much later his ideas of the sources of these phenomena changed and he accepted the idea of two many-sided gods—one of the



“good,” which he designated “God,” and the other of the “bad,” which he designated the “Devil.”

Throughout the endless centuries man further developed and then finally definitized his religious thinking and established it in formalized codes, creeds, laws, and interpretations which ultimately became accepted as authentic. Man's life then became regimented and routinized—controlled by the will of those in position and authority. And such control was maintained by all sorts of devices from common-sense explanations and visible proof to mystical ceremony, dramatics, and magic.

The inevitable happened—the “conflict between science and religion.” Man began to discover things in biology, astronomy, geology, geography, and other fields which “were not foretold by the Holy Prophets,” and which conflicted with established creed and dogma. His natural questions were met with a “you-mustn’t-think-about-that” attitude or a brazen “if-it-conflicts-then-it-is-wrong” attitude, both of which silenced the easily-silenced, but which only challenged the not-so-easily-silenced. Naturally enough, then, any new ideas, discoveries of materials, invention of new devices, development of new processes or explanations which were not according to “Holy Writ” were vigorously opposed, often with the most unreligious and barbaric of violence. Selling new ideas in religion, like selling new ideas in other fields, has usually been as dangerous as it was difficult.

Louis Agassiz once pointed out this type of opposition in these words: “Every great truth goes through three stages. First, people say it conflicts with the Bible. (The other two stages are, “people say it has been discovered before, and lastly, they say they have

always believed it anyway.") And, of course, any extra-Scriptural theory which was definitely accepted by secular authorities became, in effect, a part of "Holy Writ." Aristotle's theory of falling weights and Galen's theories of physiological processes—both of which were wrong—are good examples of definitely stated scientific conclusions which generations of later scientists did not dare to question.

Clerical opposition—and we have in mind not one but all religions—to innovations came for several reasons, a brief discussion of a few of which will serve our purpose here.

One of the most important of these reasons for clerical resistance to innovations was a fear of loss of authority. For instance, printing was opposed mostly because the Church was afraid that if an ordinary man learned to read, it would no longer be the one and only source of religious information and interpretation; if the reader, who was considered incompetent to meditate accurately on what he read, discovered doubt-bringing contradictions to established religious dogma, the Church would lose both face and influence. Public schools in America were labelled "Godless" schools. The automobile and the radio were opposed for somewhat the same reason—clerics feared that they would keep people away from religious services.

Another fear was that of worldliness. If a man became too much engrossed in the things of his immediate physical life, his interest in the things of the more remote spiritual life would suffer. Religion was considered a severe thing, something in which rigorous discipline was essential to proper spiritual growth. "What is good for the body is bad for the soul; what is bad for the body is good for the soul" is



perhaps the oldest religious philosophy in the world. Naturally then, those things which made for physical comfort and happiness—recreations, bathing, home and travel conveniences, styles and fashions—were worldly in their emphasis, hence they were to be fought. Anæsthetics were opposed because pain was considered salutary and, especially in childbirth, was “the intended inheritance of original sin.” The early Puritans opposed music in church services, everyone “sang” his own “tune,” and until recently pianos and violins were considered quite out of place in religious worship.

Another fear concerned the sources of the innovations. Many inventions, discoveries, and theories were vigorously resisted because they did not come from “our people,” religiously speaking. Coffee, tobacco, bath tubs, cremation, and printing, to illustrate, were fought largely because they did not originate in Christian lands but were introduced from the “pagans.” In a variation of this opposition, non-conformist religious groups were forced to flee. A good illustration is the French expulsion of their famous rug weavers, who happened to be Huguenots—not subscribers to the prevailing form of religion.

One of the most childish of all these fears was that the Almighty, who had established and ordained things as they were, would be “insulted” by the use of contrivances which would change them. Opposition to gas street lights because “God meant it to be dark,” and the umbrella because “God meant for humans to get wet when it rained,” are illustrative. Opposition to forks, blue clothing, the locomotive, steamboat and airplane, to standardized time, and a more accurate calendar, are other illustrations. It is interesting to

note that although prayer is an important part of nearly all religions, yet there are religious groups which ban it because they consider it an "impertinence to the Creator."

Entirely too often religious-minded man has taken a thoroughly illogical and completely unjustifiable attitude towards innovations, an attitude which he probably would not have taken, had he considered the simplest of comparisons. As a parent, man has always thrilled in watching his child learn to do things, to walk, talk, manipulate, read, write, sing, swim, and in other ways learn to control parts of his environment to his own profit, and to adapt himself successfully to other parts of it. And, if he had given it a single thought, man would have recognized that it would be just as logical to assume that his "Heavenly Father," eminently more wise than he, would similarly thrill to watch him—a grown adult in a biological way but a mere child in a larger way—learning to control parts of his own environment to his own profit and to adapt himself successfully to other parts of it.

Further, man failed to realize that his Bible—one of the most interesting of all great books—is a record of some 4000 years of Hebrew history and that, as Bruno to his sorrow pointed out, it is not a scientific treatise at all. In fact, someone has said that there is not a single worth-while technical advance recorded in it. That is not its purpose. Naturally, then, attempting to reconcile scientific data with historical accounts, or attempting to judge their merits on the basis of a literature which does not encompass or reflect them, is impossible.

Henry Ward Beecher, America's most distin-

guished religious orator, once made a statement that is exceedingly pertinent in this connection: said he, "The religion that fosters intolerance needs another Christ to die for it."

Probably, generally speaking, organized religion has been no more intolerant in its attitude towards innovations than have the organized groups in the other phases of man's life—industrial, commercial, economic, sociological, professional, educational, or military. However, in another way its intolerance has had a much greater influence because of the fact that it has always affected a much larger proportion of the population than that represented by any of the relatively smaller organized occupational groups. It is universal; it cuts across all of man's other activities irrespective of their nature or type. Consequently, on the basis of its vast influence, organized religion should really lead—and it cannot do this successfully and permanently in a life of the present as long as it is stifled by the paralyzing traditions of a life of the past. It is encouraging to note that considerable progress in this direction has been made recently. May it continue!

9. THE JOB-SAVER—Another important reason why fools are fools is based on the fear of the worker that the suggested innovation will throw him out of his job—a fear which is perfectly justified in these efficiency-worshipping days of labor-saving machinery and processes. This fear, found in about all phases of human vocational endeavor, is clearly illustrated in the textile industry of an earlier day. All the great inventors of this field—Hargreaves, Compton, Kay, Arkright, Lee, Jacquard, Cartright, Thim-

monier, Howe, and others—suffered at the hands of enraged mobs of workers who believed that their diabolical inventions would eliminate the related occupations. Protests against the introduction of these innovations took various forms—petitions to authoritative and legislative bodies, injunctions, banishments, mass meetings, riots, burnings, and even assassinations.

In a less individualistic manner inventions were resisted by organized groups, and for exactly the same reason—a fear that the innovation would eliminate or at least seriously handicap the entire industry. For example, the archers of the middle ages resisted the introduction of the musket; the writing guilds tried to block the printing press, and later the type-setters to block the linotype; stage coach, canal and river transportation companies fought the railroad, and later the railroad fought bus, truck, and airplane companies; the telegraph opposed the telephone, and when wireless appeared, these erstwhile enemies joined forces to combat the newcomer; the whale oil industry opposed petroleum which, in turn, opposed gas, which, in turn, opposed electricity; horse-breeders' associations battled against the tractor; the manufacturers of cemetery monuments fought "memorial park" associations; painters' associations opposed "patent" paints; and various labor unions are still fighting ready-mixed concrete, ready-cut houses, and other types of pre-fabricated construction.

Another way of expressing fear of change, one which has been widely and effectively used during the last few years, is suppression. This form of opposition is simple—a great industry merely buys the rights

to a patent, the exploitation of which might force it to reorganize or realign its entire structure, and then quietly locks it up and forgets about it. For instance, in 1937 the Federal Communications Commission declared that the Bell Telephone System had suppressed 3,400 unused patents in order to forestall competition.¹

A superior electric lamp which, it is estimated, will save the electric light users \$10,000,000 a year, has been invented but has not been put on the market.²

As early as 1896 the courts of the land sanctioned this policy and held that "The public has no right to compel the use of patented devices or unpatented devices when that is inconsistent with the fundamental rules of property."³

Where direct suppression is impossible, the individuals and organizations interested in preserving the status quo use not only the direct and violent methods of the past, but also the more modern method of propaganda. Many and many an inventor and manufacturer has had to face adverse publicity in the form of criticisms, rumors, stories, "scientific reports" and disparagements emanating from those who have access to appropriate channels.

Justification of suppression is based on business principles, pure and simple. A corporation is a money-making institution; it must return a profit on the funds invested in it or go out of business. And if

¹"Technological Trends and National Policy," p. 50. National Resources Committee, Washington, D. C., June, 1937.

²New York Times, January 2, 1936, p. 50.

³Vaughan, F. L., "Economics of Our Patent System," page 164, The Macmillan Company, 1925.

an innovation would wreck it, it has a perfect right to fight that innovation in order to protect itself. Even bankers, according to Charles P. Kettering of the General Motors Corporation, "regard research as most dangerous and a thing that makes banking hazardous, due to the rapid changes it brings about in industry."

On the other hand, all great industries are vitally interested in progress—they must be in order to meet competition—and most of them now have their own research laboratories. More than 35,000 research workers are now employed in a total of nearly 2,000 industrial and consulting laboratories—an increase of 496 per cent during the period 1920-1938—scattered throughout the United States. Industrial laboratory expenditures are now running close to \$215,000,000 a year.

However, there is another side to this matter of innovation-opposition in order to save jobs. In the first place, no one doubts but that mass production by the newer technological inventions has resulted in less expensive products. For instance, in 1912 fourteen man-hours were required at a cost of \$8.75, to assemble one Ford car. In 1914 the same operation required but two man-hours, at a cost of \$1.25. In 1929 the labor cost of a certain automobile door was \$4.00; in 1935 the cost was 35 cents. Handfinishing body frames before paneling cost \$3.00 in 1929, and 20 cents in 1933. A 60-watt bulb in 1907 cost \$1.75, and today costs but 15 cents. Similar comparisons in other fields reveal the same story.

In the second place, losses do occur when a new labor-saving device or process is installed. The result



is sure to be confusion; not only are the older employees forced out as their jobs are eliminated, but it takes some time for either them or the new employees to learn their new tasks. However, this period of maladjustment is usually limited to only a few years. And, still more important, the innovation directly and indirectly opens up great new fields of employment. An excellent example is in the automobile field. Around 1900, the horse-and-buggy business employed some 1,000,000 workers. The automobile eliminated nearly all of these positions, but also made new positions—which some 40 years later totalled around 6,000,000 plus another million in oil and other allied industries. Air conditioning, practically unheard of 15 years ago, is now a \$100,000,000 industry. Says Merle Thorpe: “Look at last year’s sales of one of the twenty largest corporations in America. Forty per cent of those sales came from things developed within the past ten years. . . . More than a million new inventions have found their way onto the retailers’ shelves during the past fifty years. . . . Eighteen of them developed into great industries, so great that they today provide employment for nine and a half millions of people, one-fourth of all those gainfully employed.”¹

It is not the purpose of this book to attempt to solve the many financial, economic and sociological problems involved in the adoptions of innovations. For that matter, probably as long as human beings are human beings and progress is progress some of these problems will never be solved, at least perman-

¹These Men Make our World, *Scribner's Commentator*, September, 1937.

ently. Even if they were solved for today, progress in the various fields would certainly bring a new set of problems tomorrow.

THE PSYCHOLOGICAL BASIS OF RESISTANCE

There is a psychological basis which underlies all resistance to new ideas. Man reacts mentally, emotionally, and physically in certain ways, and, when repeated, these ways become established habits which control in a manner that is largely automatic. So through the development of its elements and the interrelationships of these elements, an individual's personality becomes a definite pattern. Once established, this pattern is somewhat difficult to change.

If questions, doubts, misunderstandings, and other upsetting mental reactions are allowed to enter, they bring confusion and make readjustments necessary; and readjustments are not only disturbing but often hazardous. Hence, the easiest way to avoid all this confusion is to continue to think and act in the good old way, ignoring the new. This, in scientific terms, is psychological inertia—a natural resistance to change—once attitudes and habits are definitely fixed. Expressed in the Declaration of Independence, “. . . all experience hath shewn that mankind are more disposed to suffer while evils are sufferable, than to right themselves by abolishing the forms to which they are accustomed.”

However, man is hardly a passive animal. It is not as natural for him simply to ignore in an animal-like manner as it is for him to react to. Undoubtedly a part of this reacting-to attitude is based upon his own self-conceived feeling of superiority. In any case, instead of totally ignoring a suggested innovation,



man usually sets his defense mechanism in motion, and actively resists it; and often he slips easily from the defensive into the offensive and carries the war vigorously and sometimes violently into the enemy's camp. He justifies his reactions by means of various devices, such as: tradition—"It has never been done"; comparison—"This would be just as reasonable . . ."; rationalization—"It just can't be done for these reasons . . ."; disparagement—"Whoever heard of such a ridiculous thing," "Phooey! Just imagine . . .," and "Har, har, har." He uses the last mentioned device at least as frequently as any other, little realizing that ridicule does not represent argument—that when a man has no arguments he uses ridicule. He may not appreciate this fact, but he knows that disparagement is a most effective weapon.

THE IDEAL ATTITUDE

Obviously, while it is highly desirable for an individual to be open-minded towards new ideas, yet at the same time it should be realized that for him to accept whole-heartedly, completely, and indiscriminately would be just as stupid. It was pointed out in the Preface that although there is no progress without change, not all change represents progress. Many are the "innovations" which later experience has, at least for the time being, proved worthless. And even those which have been successful were, in their original form, crude and undeveloped, many of them even more or less complete failures. As MacIver says, "Inventions enter the world as new-born babes. Their

power to change mode of life and thoughts of men does not appear until they are grown up.”¹

Somewhere between these two extremes—a determined and closed-mind opposition to everything new, and a wide-open acceptance of it—is safe ground. In short, a tolerant-critical attitude of mind is desirable—an attitude which admits the possibilities of all innovations but which, at the same time, evaluates any such seriously, honestly, and deliberately.

May mankind early develop such an attitude!

AN INTELLIGENT PERSON
NEVER LAUGHS AT A NEW IDEA.

¹MacIver, R. M., “Civilization versus Culture,” *University of Toronto Quarterly*, vol. 1, pp. 316-332, 1932.

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